

Federal Aviation Administration

National Airspace System

Capital Investment Plan

Appendix A

For

Fiscal Years 2004-2008

Appendix A

The projects are grouped under the strategic goal they support. The Narrative for Primary Outcome Goal describes the specific contribution made to a performance goal. The projects are numbered with the budget line item (BLI) used in the supplementary information for the fiscal year (FY) 2004 budget submission to Congress. Each BLI may contain one or more Capital Investment Plan (CIP) projects, but in order to be consistent with the budget presentation, the entire BLI is assigned to the goal area that best reflects the performance goal it supports. In general, many of the Federal Aviation Administration (FAA) capital investments will contribute to more than one goal, and in those cases where it clarifies the contribution of components of budget line items to a performance goal, there will be a separate narrative discussion of how that component supports a specific goal.

The relevant performance goal is shown above each line item to provide the connection between the goal and the line item. This is consistent with direction from the Office of Management and Budget (OMB), and the Department of Transportation (DOT) and is derived from the FAA list of performance goals.

BLIs with X in their number, for example 4C01X, represent programs ending in FY 2002 or FY 2003 or new projects not currently in the President's budget.

Format of Appendix A

The sections present information by facilities and equipment (F&E) projects organized in the following format:

BLI Number; BLI Name
Project Name #1

Primary Outcome Goal: FAA Goal: The primary goal that the capital investment supports.

Narrative for Primary Outcome Goal:

Description of the BLI outcome or outputs that contribute to reaching the target level set for the performance goal that this BLI supports.

Federal Aviation Administration Capital Investment Plan Goal Matrix

1. **Department of Transportation (DOT) Strategic Goal: Safety:** Promote public health and safety by working toward the elimination of transportation-related deaths and injuries.

- 1.1. **Federal Aviation Administration (FAA) Strategic Goal: Safety:** Reduce fatal aviation accident rates by 80 percent in 10 years.

Strategies to Achieve FAA Goal:

Accident Prevention: Prevent accidents before they happen through appropriate, targeted, systematic interventions in the aviation system.

Safety Information Sharing and Analysis: Develop partnerships with the aviation community to share data and information supporting safe, secure aviation.

Certification and Surveillance: Develop new approaches to working with others on certification, inspection, and surveillance; and target FAA resources.

FAA Annual Performance Goals:

- 1.1.1 **Air Carrier Fatal Aircraft Rate** – By 2007, reduce the U.S. commercial aviation fatal aviation accident rate per aircraft departure from a 1994-1996 baseline of 0.051 fatal accidents per 100,000 departures. The fiscal year (FY) 2004 target is 0.028 per 100,000 departures.
 - 1.1.2 **General Aviation (GA) Fatal Aircraft Rate** – Reduce the number of general aviation fatal accidents. The FY 2004 target is no more than 349 fatal accidents.
 - 1.1.3 **Operational Errors** – Reduce the number of Category A & B (highest severity) operational errors. The FY 2004 target is no more than 629.
 - 1.1.4 **Runway Incursions** – Reduce the number and rate (per 100,000 operations) of highest risk (Category A & B) runway incursions. The FY 2004 target is no more than 47 Category A & B runway incursions, which is a rate of 0.072 of 100,000 operations.
2. **DOT Strategic Goal: Mobility:** Shape an accessible, affordable, reliable transportation system for all people, goods, and regions.

- 2.1. **FAA Strategic Goal: System Efficiency:** Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Strategies to Achieve FAA Goal:

Free Flight: Within safety and environmental considerations, work toward giving aircraft the opportunity to fly in a way that gives them the most benefit as they define it.

National Airspace System (NAS) Modernization: Using the NAS Architecture as the guideline, continually refine and update the NAS to achieve efficient aerospace systems and operations.

Systems Integration: Integrate airport and commercial space requirements into NAS planning and architecture.

FAA Annual Performance Goals:

- 2.1.1. **Airport Daily Arrival Capacity** – Increase the sum of facility-set arrival rates at the 35 airports identified in the Operational Evolution Plan (OEP). The target for FY 2004 is 49,120 arrivals.
 - 2.1.2. **Airport Arrival Efficiency Rate** – Increase the percent of time arrival demand is satisfied at the 35 airports identified in the OEP to 95.49 percent in FY 2004.

2.1.3. **System Efficiency** – Increase the percentage of aircraft arriving no later than 15 minutes after the scheduled arrival time to 79.2 percent in FY 2004 at the 32 largest hub airports.

3. **DOT Strategic Goal: Economic Growth:** Support a transportation system that sustains America's economic growth.

3.1. **FAA Goal: Economic Growth:** FAA also supports this DOT goal through its system efficiency goal that ensures a safe, secure aerospace system that is efficient for users.

Strategies to Achieve FAA Goal: See FAA Strategic Goal: System Efficiency: Strategies to Achieve FAA Goals.

FAA Annual Performance Goals:

3.1.1. See FAA Strategic Goal: System Efficiency: FAA Annual Performance Goals.

4. **DOT Strategic Goal: Human and Natural Environment:** Protect and enhance communities and the natural environment affected by transportation.

4.1. **FAA Performance Goal: Human and Natural Environment:** Increase the number of people in residential communities that benefit from an airport improvement program noise compatibility project.

Strategies to Achieve FAA Goal:

Understanding Aerospace Environmental Impacts: Participate in research to understand more fully the effect of aerospace on the atmosphere and the degree of regulation necessary to minimize those impacts.

Reducing Aerospace Environmental Impacts: Use combinations of regulations, research, technology, and procedures to reduce and mitigate adverse impacts from the aerospace.

Quantifying and Mitigating Environmental Impacts of FAA activities: Assess compliance with environmental regulations; honor the mandates to clean up contamination in accordance with existing agreements; reduce the use of hazardous materials at its facilities; and promote recycling.

FAA Annual Performance Goals:

4.1.1. **Noise** - The number of people in the U.S. exposed to significant aircraft noise levels. The FY 2004 target is no more than 436,000 people.

5. **DOT Strategic Goal: National Security:** Ensure the security of the transportation system for the movement of people and goods, and support the National Security Strategy.

5.1. **FAA Strategic Goal: National Security:** Most of FAA's security functions have been transferred to the Transportation Security Administration and this strategic goal is under review.

Strategies to Achieve FAA Goal:

Security Baseline: Continue to improve the baseline security system for FAA facilities.

Information Security: Develop and implement a comprehensive information system security (ISS) program and security activities to protect the national airspace and mission support systems.

Annual Performance Goal:

5.1.1 **Information Security** – Develop and implement a comprehensive ISS program and security activities to protect the national airspace and mission support systems.

6. **DOT Strategic Goal: Organizational Excellence:** Advance the Department's ability to manage for results and innovation.

6.1 **FAA Strategic Goal: People:** Prepare the workforce for the demands of the 21st century.

Reform: Become more businesslike while increasing customer responsiveness.

Strategies to Achieve FAA Goal:

People: Implement a productive and hospitable model work environment in which employees can develop to their potential and contribute fully to the organization; contributions of all employees are supported and encouraged; discrimination and harassment have been eliminated; and the nation's diversity is reflected.

Acquisition Reform: Reform acquisition processes to make them faster, simpler, and more mission-based.

Personnel Reform: Reform personnel systems to provide increased flexibility in hiring, pay, and placement; protect employee rights; increase productivity; promote high standards of accountability; enhance the agency's intellectual capital; and create incentives for change.

Financial Reform: Reform financial systems to enable a more performance-based management approach.

FAA Annual Performance Goals:

6.1.1. Achieve a green rating for the following areas in the President's Management Agenda:

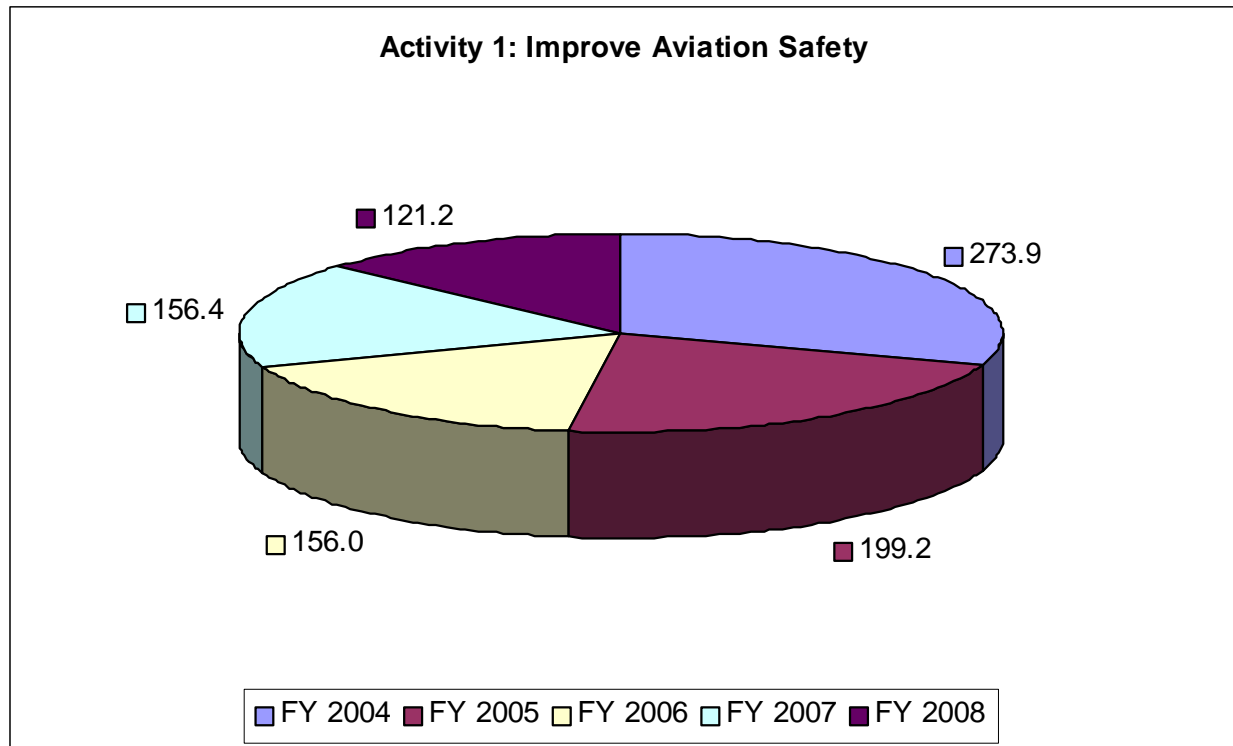
- Strategic Management of Human Capital
- Competitive Outsourcing
- Improving Financial Performance
- Expanded Electronic Government (e-Gov)
- Budget and Performance Integration

6.1.2. Improve the FAA score on the commercial pilot segment of the American customer satisfaction index survey. The FY 2004 performance target for the FAA score on the commercial pilot segment is 63.

6.1.3. Achieve 80 percent of designated acquisition milestones for critical programs and maintain program costs in 80 percent of critical programs as published in the Capital Investment Plan.

Activity 1: Improve Aviation Safety

The following graph indicates the five-year distribution of funding for F&E programs that improve aviation safety for FY 2004 to 2008. Funding is shown in millions of dollars.



1A01: Terminal Business Unit: 1A01A; Next Generation Weather Radar – Provide

- **Next Generation Weather Radar – Open Systems Upgrades**
- **Medium-Intensity Airport Weather System**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal

The Next Generation Weather Radar (NEXRAD) project contributes to the FAA's aviation safety goal of reducing fatal aviation accident rates by detecting and providing air traffic control facilities with displays of weather intensity. This project will incorporate technology upgrades to the existing NEXRAD system. There are 158 NEXRAD systems in operation. NEXRAD detects, processes, and displays critical weather information on air traffic controllers' consoles, thus enabling better definition of location, timing, and severity of weather conditions, which results in enhanced flight safety and capacity. The open systems upgrades to the NEXRAD extend its capabilities through incorporating higher-technology equipment. Additionally, open systems architecture allows all compatible platforms to process the data to be used. This upgrade allows faster update rates for critical air traffic control (ATC) decision-makers and provides 6-month software updates for system advancements.

Fielding of 40 medium intensity airport weather systems (MIAWS) contributes to the air carrier and general aviation safety goal by providing information to controllers that enables them to warn pilots about severe wind shear conditions. The system will be deployed to those airports with limited wind shear detection capabilities. It makes near real-time weather information available to air traffic controllers and increases the number of airports that have wind shear warning capability. The MIAWS displays information collected by the NEXRAD radars that gives controllers awareness of severe weather conditions for areas controlled by their air traffic control facilities. The MIAWS will be used to alert the air traffic control system command center of the severity, location, movement, and expected duration of severe weather phenomena. Another significant benefit of MIAWS is that it extends weather flight information service (FIS) capabilities to air traffic controllers at locations not provided detailed weather displays. The timely relay of weather events to air traffic controllers may allow routing alternatives for pilots in the air and on the ground preparing for departure, which improves flight safety.

1A01: Terminal Business Unit: 1A01B; Terminal Doppler Weather Radar – Provide

- **Terminal Doppler Weather Radar – Product Improvements**
- **Terminal Doppler Weather Radar – Service Life Extension Program**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative of Primary Outcome Goal:

The Terminal Doppler Weather Radar (TDWR) project contributes to the FAA's air carrier and general aviation safety goal of reducing fatal aviation accident rates by providing accurate and timely detection of hazardous aviation weather conditions such as wind shear and gust fronts. TDWRs are installed at higher-density airports with high occurrences of thunderstorms and provide controllers with information on severe weather so that warnings can be issued to pilots. TDWRs are operational at 45 airports and detect and display hazardous wind shear events in and near the airport's approach and departure zones.

The product improvements contribute to safety goals by improving detection of microburst and gust fronts and by providing this information graphically on displays for use by air traffic controllers in the tower cab with aural alarms. Timely display of this information enables air traffic controllers to provide advisories to both aircraft in flight and aircraft on the ground preparing for departure.

The TDWR service life extension program contributes to safety goals by improving TDWR software architecture integration and replacing existing components with more reliable components that will enable the TDWR to continue operation until 2020.

1A01: Terminal Business Unit: 1A01C; Airport Surface Detection Equipment

- **Airport Surface Movement Detection Equipment – Service Life Extension Program**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Airport Surface Detection Equipment Model 3 (ASDE-3) project contributes to the FAA's safety goals to reduce runway incursions and operational errors by providing air traffic controllers with a video display of aircraft, vehicles, and obstacles on an airport's runways and taxiways. There are 32 operational ASDE-3s and two support systems. The ASDE-3 radar assists the ground controller in preventing collision situations and ensuring orderly movement of aircraft and ground vehicles on the airport surface when visibility restrictions prevent controllers, pilots, or vehicle operators from seeing other ground traffic on the airport surface. The ASDE-3 radar is the primary detection sensor providing input to the airport movement area safety system, which enhances ASDE-3 by providing automated alerts of potential conflicts. The service life extension program replaces obsolete parts to improve system reliability and maintainability and extends the useful life of the ASDE-3 an additional 10 years beyond its original 20-year lifecycle to 2015.

1A01: Terminal Business Unit: 1A01D; Airport Surface Detection Equipment – Model X

- **Airport Surface Detection Equipment - Model X**
- **Airport Surface Detection Equipment – Model X (Tech Refresh and Disposition)**
- **Upgrade Airport Surface Detection Equipment – Model 3 Sites with Multilateration/Automatic Dependent Surveillance - Broadcast for Initial 7 Sites**
- **Upgrade Surface Detection Equipment – Model 3 Sites with Multilateration/Automatic Dependent Surveillance – Broadcast for Initial 7 Sites (Tech Refresh and Disposition)**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Airport Surface Detection Equipment-Model X (ASDE-X) project contributes to the FAA's safety goals to reduce runway incursions and operational errors. The primary benefit of the ASDE-X is that it increases airport safety by providing enhanced air traffic control situational awareness. The ASDE-X conflict detection alerting equipment with multilateration will provide detailed coverage of runways and taxiways and alert air traffic controllers to potential collisions. The alerts are both visual and aural. The ASDE-X system depicts aircraft and vehicle position with identification information overlaid on a color map showing the surface movement area and arrival corridors. The ASDE-X assists air traffic controllers by identifying the location of surface traffic during visual meteorological conditions as well as during instrument meteorological conditions when inclement weather impairs visibility from the tower.

ASDE-X is a modular surface surveillance system capable of processing radar, multilateration, and automatic dependent surveillance-broadcast (ADS-B) sensor data, which provides seamless airport surface surveillance to air traffic controllers. The ASDE-X system was designed for second-tier airports and as a product improvement/upgrade for ASDE-3 airport movement area safety system airports. The FAA announced in June 2000 that ASDE-X would deploy 25 operational systems and four support systems. Additionally, the ASDE-X product improvement/upgrade for ASDE-3 sites will be deployed at seven operational ASDE-3 sites, bringing the total deployment to 32 operational systems and four support systems.

1A01: Terminal Business Unit: 1A01X; Weather Systems Processor

- **Airport Surveillance Radar Weather Systems Processor**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Weather Systems Processor (WSP) project contributes to the FAA's safety goal of reducing fatal aviation accident rates by providing air traffic controllers with warnings of wind shear and microburst events that can be communicated to pilots in the air or while they are preparing for departure. WSP is a less costly alternative to TDWR and provides weather situational awareness for tower and TRACON ATC personnel. It provides prediction data for gust fronts and storm-cell motion that will impact flight operations. To improve flight safety, WSPs are installed at medium- and large-sized airports that do not have a TDWR to detect and warn pilots of hazardous wind shears and microbursts. A technology refresh program will be started in FY 2007 to replace obsolete hardware, which will enable the system to operate beyond 2010.

1A02: Aviation Weather Service Improvements:

- **Integrated Terminal Weather System – Development/Procurement**
- **Integrated Terminal Weather System – Corridor Integrated Weather System**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Aviation Weather Service Improvement projects contribute to the FAA's safety goal of reducing fatal aviation accident rates by consolidating and processing weather information from multiple sensors, forecasting the future path of the weather, and delivering aviation weather information to pilots, airline operations centers, and air traffic controllers.

The Integrated Terminal Weather System (ITWS) project contributes to safety by providing aviation weather products to commercial and general aviation users and air traffic control facilities. Air traffic controllers use this information to issue advisories to ground and airborne aircraft that aid in preventing commercial- and general aviation-related accidents. The integrated products from sensors, including TDWR, NEXRAD, the low-level wind shear alert system (LLWAS), and automated surface observing system (ASOS) are relayed to the ITWS computers. ITWS will be deployed to 34 high-activity airports that have demonstrated a significant convective weather history. ITWS displays the current terminal weather situation and provides continuous predictions of anticipated weather conditions for 10 and 20 minutes into the future. Integrating data and products from various FAA and National Weather Service sensors and from weather data from aircraft (via the meteorological data collection and reporting system) provides the accuracy and sophisticated predictions that are essential to ITWS. Weather information provided to an ITWS at one terminal radar approach control (TRACON) can cover multiple airports. A total of 34 operational ITWSs will provide weather information for 49 airports.

The Corridor Integrated Weather System project contributes to the air carrier and general aviation safety goal by delivering information on aviation-related weather events that may impact safety to air traffic controllers responsible for flight operations in a given sector. The information provided is specific to corridors that pass through these air traffic control sectors. The corridor integrated weather system enables air traffic controllers to detect and display weather events from several sources, which the controller can use to provide flight advisories. The weather information may also be used to reroute airborne traffic to avoid adverse weather.

1A03: Low Level Wind Shear Alert System – Upgrade

- **Low Level Wind Shear Alert System – Upgrade Low Level Wind Shear Alert System to Expanded Network Configuration**
- **Low Level Wind Shear Alert System – Disposal/Decommissioning of Low Level Wind Shear Alert System Model 2**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Low Level Wind Shear Alert System (LLWAS) Upgrade project contributes to the FAA's safety goal of reducing fatal aviation accident rates by improving the sensors that provide the information to air traffic controllers to issue wind shear alerts to pilots. Wind shear conditions are common in the United States, especially in areas where thunderstorms are frequent. Hazardous wind shear and microburst conditions can occur at low altitudes near airports and pose a significant threat to aircraft during takeoff or landing. LLWAS provides real-time detection of these weather events that affect flight safety. LLWAS provides coverage at airports with no other wind shear detection capability, and it can also effectively complement radar detection of wind shear by measuring wind velocity at several points on an airport surface.

There are four components to the LLWAS program:

1. LLWAS network expansion (NE) upgrades nine existing LLWAS-2 sites to the LLWAS-NE configuration. LLWAS-NE is being used at airports where the airport radar with WSP is not located optimally for providing wind shear information.
2. The LLWAS pole relocation project improves current performance by relocating/replacing anemometers and poles.
3. The LLWAS sustainment project upgrades all standalone LLWAS-2 systems to the LLWAS-NE performance level. The relocation and sustainment upgrades result in the LLWAS-relocation/sustain configuration.
4. The LLWAS Disposal/Decommissioning project dismantles and disposes of LLWAS-2 systems that have been replaced by WSP or TDWR systems. Disposal of 40 LLWAS-2 systems is scheduled to begin in FY 2004 and will restore the sites to original condition.

1A04: Aviation Safety Analysis System

- **Aviation Safety Analysis System**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Aviation Safety Analysis System project contributes to the FAA's air carrier and general aviation safety goals by providing automation hardware and software and communication process updates to support aviation safety information databases. The safety workforce can use these databases to support its work in certifying and regulating airlines, aircrew, and other licensed companies in aviation. Having the information improves the development of safety regulations and the oversight of the civil aviation industry. The information technology (IT) infrastructure and software systems can also be used to share data and information, which supports safe aviation practices through partnership with the commercial aviation community.

These tools can be used to meet FAA's certification, inspection, and industry surveillance mission responsibilities. Enhancements in safety and security information systems and infrastructure are essential to ensure development of effective safety standards; informed monitoring of aviation safety/security performance; and conduct of aviation safety education as a basis for safety and security research. Aviation safety analysis system information supports decisions to issue and update certificates for the design and manufacture of aircraft and to issue licenses for air operators and airmen, including medical certificates. These safety-related automation tools also enable monitoring performance of aviation designees. Information from the FAA accident investigation program is stored in the system for analysis and can be used for developing new safety policies and regulations.

1A05: Integrated Flight Quality Assurance System

- **Integrated Flight Quality Assurance System**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Integrated Flight Quality Assurance (IFQA) project contributes to the FAA's safety goal of reducing the fatal aviation accident rates by providing the electronic capability for collecting and analyzing individual aircraft flight data to discover operational safety issues. Airlines compile the data from aircraft flight data recorders and transmit it to the FAA. The project includes developing and maintaining a secure Internet-based FAA electronic data acquisition and information infrastructure, which will enable the FAA to access airline operational quality assurance trend data that is used for safety oversight. IFQA will be used to develop FAA policy on airline safety and to conduct informed decision-making regarding aviation safety initiatives for the airlines.

1A06: System Approach for Safety Oversight

- **System Approach for Safety Oversight**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The System Approach for Safety Oversight (SASO) project contributes to the FAA's air carrier and general aviation safety goals by providing the capability to identify aircraft accident causal factors. Through this approach, risk mitigation efforts are developed to address those causal factors. SASO enhances oversight analysis by providing tools to identify patterns of sub-critical individual failures that combine to create an accident and by providing a complete set of additional analytical tools to help target inspections and identify corrective actions in the areas of highest potential vulnerability with the highest probability of occurrence. SASO is an important tool in developing criteria for safety regulations.

1A07: Aviation Safety Knowledge Management Environment

- **Aviation Safety Knowledge Management Environment**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Aviation Safety Knowledge Management Environment (ASKME) project contributes to FAA's air carrier and general aviation safety goals by providing a database of information to be used in certifying aircraft. The ASKME system will electronically store the FAA technical documentation and lessons learned in the aircraft certification process so that the information can be used to identify aircraft design and manufacturing issues that need to be addressed to avoid safety problems with new aircraft. ASKME can also be used to store such information as service and maintenance difficulty reports for existing aircraft to identify potentially dangerous conditions and remedy them before an accident occurs.

1B01: Safe Flight 21

- (A) **Safe Flight 21 – Alaska Capstone Initiative**
- (B) **Safe Flight 21 – Ohio Valley Prototype Project**
- (C) **Automatic Dependent Surveillance Broadcast – Advanced Technology Development and Prototyping**

(A) Safe Flight 21 – Alaska Capstone Initiative

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Alaska Capstone Initiative (ACI) contributes to the FAA's air carrier and general aviation safety goals of reducing fatal aviation accidents in Alaska by using integrated interdependent technologies, such as satellite-based navigation and surveillance capabilities, which can be used for more precise air traffic control and other

improvements in flight safety. ACI provides an improved ground and air infrastructure that gives pilots near real-time information on the location and severity of hazardous weather and the aircraft's proximity to terrain. ACI also provides improved instrument approach capability for the runways at small airports. The improved surveillance information (which fills the gaps in radar coverage) is displayed for controllers on existing ATC automation equipment and is used in sequencing and separating flights, flight following, and search and rescue activities. ADS-B transmitted information will allow pilots to fly at lower altitudes for both en route and approach and departure routes under instrument flight rules conditions because it greatly reduces the risk of colliding aircraft with the terrain. The capability for pilots to know where they are in all weather conditions and the proximity to terrain, as well as location of other air traffic, has a high potential for reducing aviation accidents.

The Alaskan Region is conducting an operational demonstration of the necessary communication, navigation, and surveillance (CNS) technologies and associated procedures, techniques, and certifications necessary to realize the benefits of ACI. Avionics and ground infrastructure being used have passed testing, certification, and operational approval for safe introduction into the existing Alaskan operational environment.

Increased safety benefits from ACI utilization are:

- Text and graphical weather information can be provided to the pilot via data link so that pilots can avoid severe weather.
- Pilot situational awareness can be increased by providing terrain and obstacle information.
- Low-visibility terminal operations are improved by installing weather-sensing facilities and designing global positioning system (GPS) approaches for remote sites.
- Integrating ADS-B data with radar and ATC automation systems improves ATC capabilities.
- Using ADS-B provides additional surveillance coverage and fills gaps in current radar coverage.

(B) Safe Flight 21 – Ohio Valley Prototype Project

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

This Ohio Valley Prototype Project contributes to the FAA's air carrier and general aviation safety goals by providing improved aircrew and air traffic controller situational awareness through the direct transfer of cockpit data that allows for improved decision-making. Information is provided directly to the pilot through high-volume transmission and high-fidelity displays of all traffic in the airspace that the receiving aircraft occupies. As a result, the pilot can make decisions and flight route requests based on actual air traffic information. This allows aircraft to fly at their optimum altitude, speed, and routing, resulting in more efficient traffic flows while maintaining a high level of safety.

(C) Automatic Dependent Surveillance Broadcast – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Automatic Dependent Surveillance-Broadcast (ADS-B) project contributes to the FAA's air carrier and general aviation safety goals by developing systems standards for use of ADS-B technology in terminal, en route, and oceanic airspace and on the airport surface. Developing domestic and international ADS-B performance standards will result in system design that will enhance surveillance for pilots and controllers and result in improved safety. ADS-B technology potentially can enhance surveillance for air-to-air, air-to-ground, and airport surface applications. Being able to use fast-update rates of aircraft position and highly accurate information about aircraft and vehicle movements will be a significant improvement over present systems. An advanced prototype has used this technology to display data for pilots to use during flight.

1C01: Advanced Technology Development and Prototyping

- (A) Separation Standards**
- (B) Runway Incursion Reduction**
- (C) System Capacity, Planning, and Improvements**
- (D) Operations Concept Validation**
- (E) Software Engineering Resource Center**
- (F) Airspace Management Laboratory**
- (G) National Airspace System Requirements Development**
- (H) General Aviation/Vertical Flight Technology**
- (I) Domestic Reduced Vertical Separation Minima**
- (J) Safer Skies**
- (K) Information Security Architecture**
- (L) Safety Analysis and Assessment**
- (M) Required Navigation Performance**
- (X) Decision Support Tools**

(A) Separation Standards – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Separations Standards project contributes to the FAA's system efficiency goal by determining the regulatory steps and aircraft equipment necessary to allow aircraft to fly with 1,000 feet of vertical separation, rather than the currently required 2,000 feet, and with reduced horizontal separation over the oceans. Increased efficiency occurs because additional flight levels are made available to oceanic airspace users, so aircraft can fly more direct and fuel-efficient routes. Oceanic flight efficiency is further improved because fewer flights need to be held on the ground waiting for altitude assignments before departure is approved.

(B) Runway Incursion Reduction Program – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Runway Incursion Reduction Program (RIRP) contributes to the FAA's safety goals to reduce runway incursions and operational errors. The RIRP explores new techniques for reducing runway incursions through research, development, demonstration, and evaluation of new and emerging methods and operational procedures and through exploration of new technology to enhance those methods and procedures. Key initiatives in the RIRP research program are (1) expand and improve surface situational awareness for air traffic controllers, pilots, and airport vehicle operators; (2) make surveillance information readily available in all airport surface operational areas; and (3) develop procedures to explore new technologies when they are available.

(C) System Capacity, Planning, and Improvements – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The System Capacity, Planning, and Improvements project contributes to the FAA's system efficiency goal by analyzing improvements that increase capacity to handle air traffic, reduce system delays, and reduce the development time for new operational criteria and procedures. This analysis results in reduced implementation risks for projects planned for the OEP and the NAS Architecture. These studies also serve as the basis for discussion between the FAA and the industry on capacity issues. Specifically, this program provides dedicated resources to:

- Develop and improve aviation safety strategies.

- Deliver problem-solving research and implementation capability.
- Develop metrics data for customers.
- Analyze risk mitigation factors to increase operational efficiency.
- Conduct analysis and simulation studies for capacity improvement.
- Develop data systems designed to track, process, and analyze air traffic data.

(D) Operations Concept Validation – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Operations Concept Validation project contributes to the FAA's system efficiency goal by providing well-defined "validated" operational concepts to support transition to new equipment planned in the NAS Architecture. It provides information to the aviation community for development of new procedures to use with the new technology being implemented in the NAS and the changes in aircraft equipment necessary to be compatible with that technology. Information developed includes system specification, roles and responsibilities, procedures, training, and certification requirements. Results also define requirements for future systems and help establish the specifications for acquisition (e.g., en route automation modernization). The operational concept development and validation outputs provide for the continued development and support of NAS modernization through: (1) concept/scenario development; (2) concept validation; (3) simulation and analysis; (4) system design; (5) metric development; and (6) modeling.

(E) Software Engineering Resource Center – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Software Engineering Resource Center (SERC) program contributes to the FAA's system efficiency goal by optimizing the processes for developing, acquiring and fielding high-quality, mission-critical systems that require software. SERC's mission is to improve the FAA's software technology base and software engineering competencies. Leveraging expertise from government, academic, and industry sources, the SERC is a focal point for solving mission-critical software problems, conducting software systems engineering research, and providing unique educational opportunities for FAA personnel. The NAS is a worldwide ATC system that covers many different sites and locations requiring site-specific "adaptation". Each facility has its own set of airspace structures and air/ground infrastructure that defines the operating environment. Within each facility, internal settings, such as the number of devices and their connections (e.g., displays and radars), have to be determined. Because of all these varying factors, NAS software must be "adapted" to fit a particular site in order to provide efficient and safe air traffic control services.

Fielding NAS systems is a continuous process with many software challenges. The SERC is working to modernize the way the FAA collects, stores, standardizes, distributes, and manages aeronautical and adaptation data, which will enable NAS systems to be fielded faster.

(F) Airspace Management Laboratory – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Airspace Management Laboratory program contributes to the FAA's system efficiency goal by providing traffic information data, metrics, and tools to analyze traffic and airspace configurations that optimize air space traffic flow. Traffic information is collected from the enhanced traffic management system and local facility data points to

construct historical traffic and system-loading metrics. Traffic specialists and analysts use this data to analyze, design, and benchmark existing and proposed airspace structures in the en route and terminal areas. The sector design and analysis tool is the primary tool that the FAA uses to perform this function.

(G) National Airspace System Requirements Development – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace Systems Requirements Development project contributes to the FAA's system efficiency goal by providing specifications that are used for identifying and evaluating new technologies to meet the needs of aerospace users and improve system efficiency. The project also develops the plans and new procedures to transition from the existing technologies and practices to advanced capabilities that satisfy user needs and advance overall NAS system efficiency.

(H) General Aviation/Vertical Flight Technology – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The General Aviation/Vertical Flight Technology program contributes to the FAA's general aviation safety goal by expediting implementation for components of new CNS technology into general aviation and helicopter operations. Implementing this new technology often involves using improved avionics and considering aircraft and aircrew performance capabilities. It enables increased numbers of aircraft to receive instrument flight rules services on a cost-efficient basis. The program also evaluates techniques that enable aircraft operating under visual flight rules to navigate at a higher level of precision and awareness of the proximity of other aircraft and obstacles.

Examples of the new technologies that can benefit general aviation include the GPS, wide area augmentation system (WAAS) and local area augmentation system (LAAS) programs, dependent surveillance programs, and Safe Flight 21, the Safer Skies initiative.

(I) Domestic Reduced Vertical Separation Minima – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Domestic Reduced Vertical Separation Minima project contributes to the FAA's system efficiency goal by developing standards that will allow use of six additional altitudes between 29,000 and 41,000 feet in domestic airspace. Using these altitudes will reduce airspace congestion and allow aircraft to fly at altitudes that are more fuel-efficient. Current standards require 2,000 feet of vertical separation between aircraft. To allow reduced vertical separation, FAA must develop new procedures and regulations to maintain the high level of safety for air travel.

(J) Safer Skies - Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Safer Skies program contributes to the FAA's safety goal by analyzing causes of accidents and developing and implementing intervention strategies to prevent or reduce factors that are the leading causes of aviation accidents. Safer Skies has identified the major types of accidents and evaluated pilot actions and equipment failures that lead

to the major types of accidents. This information can be used to develop and evaluate corrective actions that will reduce accident rates.

(K) Information Security Architecture

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Information Security Architecture project will improve the FAA's safety and security by providing effective and suitable, commercially based procedures and practices for developing information systems security assurance solutions that will guide the air traffic and acquisition communities within the FAA toward more standardized, interoperable, and repeatable solutions. Increasing emphasis on response to Homeland Security threats coupled with vulnerabilities inherent in acquiring commercial-off-the-shelf (COTS) products and services demand that FAA focus more on developing and implementing information systems security products, procedures, and engineering practices. This will reduce stovepipe strategies and approaches to security requirements and increase the pace of implementing technical and procedural solutions that provide more cost-effective, centralized management of ISS protection, detection, and response. Funding for advanced development and prototyping in this element leverages funds applied by NAS systems and programs toward corporate, NAS-wide security capabilities and services.

(L) Safety Analysis and Assessment – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Safety Analysis and Assessment program contributes to the FAA's safety goal by executing a system engineering based safety management system (SMS) that will identify hazards in the NAS associated with introduction of new systems and capabilities. The SMS will assess each hazard for end-to-end safety risk, develop mitigation strategies and requirements, and verify the mitigation's effectiveness in maintaining or improving NAS safety. The SMS will enable the FAA to comply with internal (FAA Order 8040.4) and external (International Civilian Aviation Organization (ICAO) Annex 11) requirements for the agency to proactively manage the safety risk inherent in the providing air traffic services.

(M) Required Navigation Performance

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the need of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Required Navigation Performance (RNP) program will contribute to the FAA's system efficiency goal by providing improved capacity and efficiency in the NAS. RNP must be accounted for in new CNS technologies, as it enables precision lateral and vertical navigational guidance. The RNP program office will be required to develop criteria, standard operating procedures, training, and risk mitigation and safety strategies in each of the operating domains.

(X) Decision Support Tools – Advance Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the need of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Decision Support Tools project contributes to the FAA's system efficiency goal by evaluating National Aeronautics and Space Administration and other research organizations' ideas and concepts for ATC and flow management tools and by providing applicability and feasibility feedback necessary for the tools to be useful at completion of their development cycles. The project will accomplish feasibility analyses and modeling of proposed uses of decision support tools before their prototyping and will provide independent evaluation testing of decision

support tool prototypes. Researchers and developers will be part of the analysis and evaluation teams and will receive test results and associated analyses and conclusions.

1C02: Aircraft Related Equipment Program

(A) Aircraft Related Equipment Program

(B) Aircraft Related Equipment Program – Boeing Simulator Replacement

(A) Aircraft Related Equipment Program

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Aircraft Related Equipment Program contributes to the FAA's air carrier and general aviation safety goals by upgrading FAA aircraft used for safety-related work. Examples are: (1) FAA flight inspection aircraft, avionics, and related systems must be updated to ensure capabilities to validate and certify the accuracy and integrity of the electronic signals emitted by navigational aids used in the NAS by commercial and general aviation aircraft; (2) flight inspection aircraft must be equipped to validate and certify new instrument flight procedures developed for use by commercial and general aviation pilots to guide aircraft on approach and departure flight paths at airports; and (3) aviation safety inspectors use FAA aircraft to achieve and maintain their currency and proficiency so that they can regulate and certify pilot instructors and test pilots. The FAA aircraft used for this purpose must be equipped with the avionics and systems representative of the current and future aviation environment.

(B) Aircraft Related Equipment Program – Boeing Simulator Replacement

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Boeing Simulator Replacement Program contributes to the FAA's air carrier safety goal by purchasing an aircraft simulator that has the modern configuration of the airline fleet, enabling the FAA to perform meaningful and relevant evaluations of projects affecting large-transport category aircraft. The simulator can be used for operational evaluation of the latest aviation technologies, equipment, and procedures using flight simulation rather than actual flight hours, which are very costly. Data gathered from flight simulation activities are used to support safety investigations and to develop regulations.

1C03: National Aviation Safety Data Analysis Center

- **National Aviation Safety Data Analysis Center**

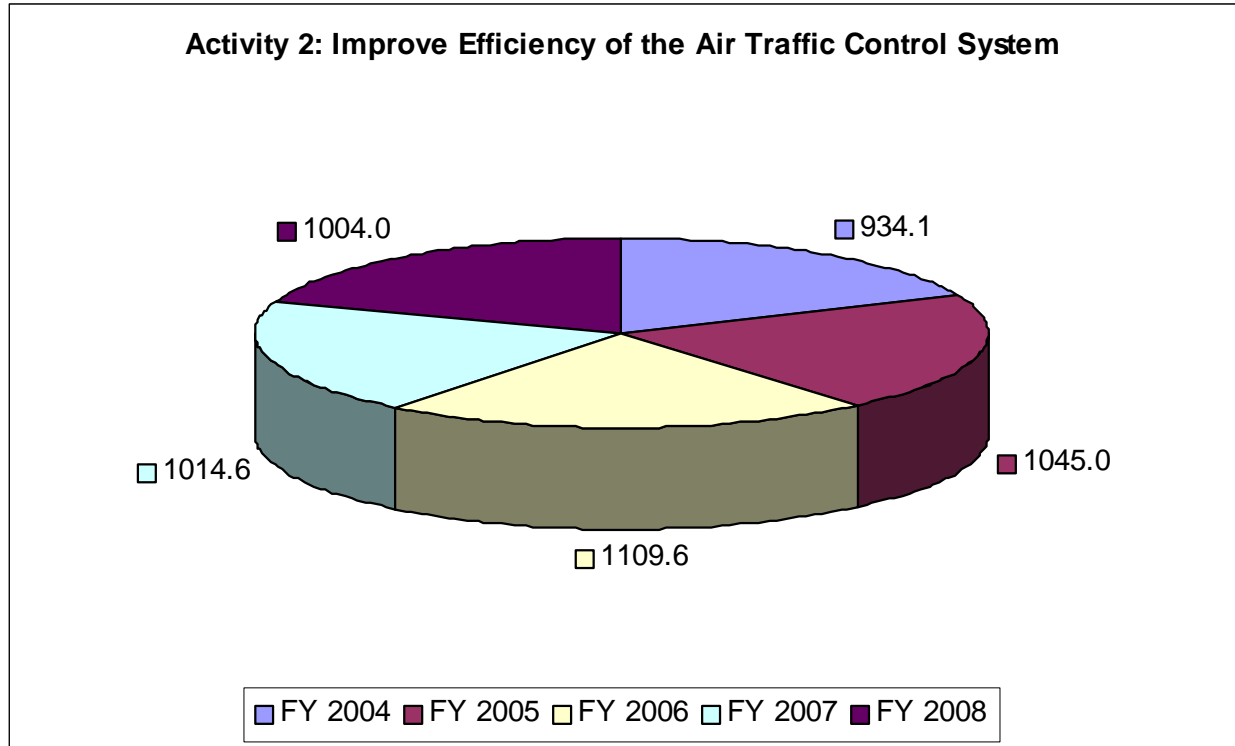
Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The National Aviation Safety Data Analysis Center contributes to the FAA's air carrier and general aviation safety goals by performing data analysis that is used to support identification and analysis of precursors to aviation accidents. Additionally, the center supports investigation and resolution of aviation accidents by acquiring and sharing analytical automation tools and automated analysis across multiple databases and distributing quality data to the FAA and aviation community.

Activity 2: Improve Efficiency of the Air Traffic Control System

The following graph indicates the five-year distribution of funding for F&E programs that improve efficiency of the air traffic control system for FY 2004 to 2008. Funding is shown in millions of dollars.



2A01: Terminal Business Unit: 2A01A; Terminal Automation Program

- **Standard Terminal Automation Replacement System – Development and Procurement**
- **Terminal Sustain**
- **Interim Tower Displays**
- **Standard Terminal Automation Replacement System – Technology Refresh**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Terminal Automation Program contributes to the FAA's system efficiency goal of increasing the percentage of flights arriving on time and the percentage of arrival demand met by airports by modernizing terminal automation systems. New automation tools can be used to enhance the capacity to handle increased air traffic approaching and departing airports. The Standard Terminal Automation Replacement System (STARS) will provide new digital computer workstations with high-resolution color displays that allow the FAA to move toward a uniform configuration at all terminal facilities and add enhanced automation software to use airport runway capacity more efficiently.

The Interim Tower Display project gives controllers in the tower cab more accurate information on arriving flights by providing digital-capable displays for the air traffic control towers (ATCT) that do not have a radar display in the cab environment; the display extends the air traffic controller's "eyes" in the cab environment.

The Terminal Sustain project supports the FAA's system efficiency goal by providing support and upgrades of the automated radar terminal system and the digital bright radar indicator tower equipment radar displays used in the tower cab. Sustaining these systems prevents outages and potential delays.

2A01: Terminal Business Unit: 2A01B; Air Traffic Control Beacon Interrogator – Replacement

- **Secondary Surveillance - Air Traffic Control Beacon Interrogator – Replacement**
- **Air Traffic Control Beacon Interrogator Model 6 - Beacon Only Facility Establishment**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Air Traffic Control Beacon Interrogator (ATCBI) project contributes to the FAA's system efficiency goal by replacing obsolete systems. The secondary surveillance system and aircraft position and altitude data, significantly enhance controllers' ability to separate aircraft while reducing controller workload. The ATCBI-6 system replaces all en route ACTBI-4/5 beacon systems that have reached the end of their service life. The existing beacon interrogators are costly to maintain, repair, and support and have a higher risk of failure, which could contribute to severe air traffic delays throughout the NAS. The ATCBI-6 provides air traffic controllers with selective interrogation capability not available in the older systems that significantly improves the accuracy of aircraft position and altitude data provided to ATC automation systems. Additionally, the ATCBI-6, in conjunction with a co-located primary long range radar, provides aircraft position information and backup center radar approach surveillance service to numerous TRACON facilities in case of the loss of terminal radar services and/or scheduled maintenance downtime. The ATCBI-6 system is a low-cost, highly reliable, very accurate and more capable replacement for old, high-cost, and obsolete beacon interrogators with high failure rates.

The ATCBI-6 Beacon Only Facility Establishment project contributes to the FAA's system efficiency goal by establishing buildings that will house the new beacon interrogators. The new buildings will help protect the beacon interrogators from outage caused by severe weather or other causes.

2A01: Terminal Business Unit: 2A01C; Air Traffic Control En Route Radar Facilities Improvements

- **Long Range Radar Program – Long Range Radar Improvement – Infrastructure Upgrades**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Long Range Radar Program contributes to the FAA's system efficiency goal by continuing to provide aircraft position information to air traffic controllers. Long range radars directly display aircraft position when the beacon interrogator is not functioning. These radars also detect aircraft that experience failure of onboard equipment that responds to beacon interrogators or aircraft that do not turn on the onboard equipment. This project finances upgrades to the radar transmitters, and antenna drive systems and improvements to the buildings that house these radars. Without these upgrades, operational problems that occur each year could limit controllers' ability to detect aircraft that do not cooperatively display identification and flight data.

2A01: Terminal Business Unit: 2A01D; Terminal Air Traffic Control Facilities – Replace

- **Air Traffic Control Tower/Terminal Radar Approach Control Establish/Sustain/Replace – Air Traffic Control Tower/Terminal Radar Approach Control Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Terminal Air Traffic Control Facilities projects contribute to the FAA's system efficiency goal by replacing air traffic control towers to meet current and future operational requirements. Some replacements are required to accommodate growth in air traffic; others are needed to provide added space for new equipment; and, in some cases, the tower must be replaced to ensure that controllers have an unobstructed view of runways and taxiways. The average control tower is 27 years old, and, as volume and complexity of terminal air traffic control increases, additional positions in the ATCT/TRACON facilities are required.

2A01: Terminal Business Unit: 2A01E; Air Traffic Control Tower/Terminal Radar Approach Control Facilities – Improve

- (A) **Air Traffic Control Tower/Terminal Radar Approach Control Modernization**
- (B) **Large Terminal Radar Approach Controls - Advanced Facility Planning**
- (C) **Standard Terminal Automation Replacement System Facility Upgrades**

(A) Air Traffic Control Tower/Terminal Radar Approach Control Modernization

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Air Traffic Control Tower/Terminal Radar Approach Control Modernization project contributes to the FAA's system efficiency goal by modernizing and improving terminal ATC facilities. TRACONs are modernized to support growth in air traffic or to provide additional capabilities that must be implemented to improve NAS efficiency. The improvements also modernize facility infrastructure, such as electrical distribution systems and heating and air-conditioning, while correcting structural problems to minimize outages that would delay air traffic.

(B) Advanced Facility Planning

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Advanced Facility Planning project contributes to the FAA's system efficiency goal by allowing a smooth and orderly transition of new equipment into existing or modernized facilities. Conducting studies to identify operational needs and physical details of the infrastructure helps in constructing a transition plan that minimizes transition cost and time. The changing dynamics of the FAA's ATC system infrastructure requires continual planning and assessments to achieve overall system efficiency. This project encompasses advanced studies to identify operational needs and opportunities for modernization, expansion, replacement, or consolidation of air traffic control facilities.

The Advanced Facility Planning project identifies operational, facility, and environmental deficiencies and provides alternative solutions to correct them. The project will identify the most cost-effective solutions to ensure that the facility operations, capacity, and infrastructure needs are met. It will also ensure that coordination and planning efforts will be carried out with city, state, industry, and other public agencies to determine the alternative evaluations and analyses.

This project will provide advanced studies that may consist of cost/benefit analyses; cost-effectiveness analyses; environmental, human resource requirement studies; and studies to determine solutions to capacity and delay issues.

(C) Standard Terminal Automation Replacement System Facility Upgrades

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Standard Terminal Automation Replacement System (STARS) Facility Upgrades project contributes to the FAA's system efficiency goal by completing ATC facility upgrades required to deploy STARS. Installing STARS will enable controllers to use enhanced automation aids to control air traffic. Facility-unique updates or improvements, such as electrical power systems, heating, ventilation and air-conditioning, and removal of hazardous materials, must be completed before delivery and installation of new systems.

2A01: Terminal Business Unit: 2A01X; Large Terminal Radar Approach Controls

- **Potomac Consolidated Terminal Radar Approach Control**
- **Northern California Terminal Radar Approach Control**
- **Dallas Ft. Worth Terminal Radar Approach Control**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Large TRACON projects contribute to the FAA's system efficiency goal by physically and operationally consolidating multiple, individual TRACONs—which provide air traffic control services in their respective metropolitan areas—into combined facilities. The consolidation will result in system efficiencies because of less restrictive allocation of airspace and more flexible procedures to deal with peak demand periods and adverse weather, and significant reductions in the amount of pilot/controller communications required. FAA controllers and traffic management will achieve increased productivity because of improved coordination and planning.

2A01: Terminal Business Unit: 2A01F; Terminal Digital Radar - Airport Surveillance Radar Model 11

- **Airport Surveillance Radar Model 11 - Airport Surveillance Radar Model 7/Model 8 Replacement**
- **Airport Surveillance Radar Model 11 – Technology Refresh**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Terminal Digital Radar Program contributes to the FAA’s system efficiency goal by replacing existing airport surveillance radar model 7/model 8 (ASR-7/8) radar systems and associated ATCBI 4/5 systems with the new ASR-11 digital radar system, which has an integrated primary and secondary sensor. The replacement improves surveillance service reliability and provides 6-level weather detection and display capability. Replacing the existing radars with modern technology decreases the probability of outages and resulting air traffic delays.

2A01: Terminal Business Unit: 2A01G; Airport Surveillance Radar - Airport Surveillance Radar Model 9

- **Airport Surveillance Radar Model 9 – Service Life Extension Program**
- **Airport Surveillance Radar Model 9 – Occupational Safety and Health**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The Airport Surveillance Radar program contributes to the FAA’s system efficiency goal by upgrading the digital radar surveillance systems that have been installed at 135 airports. The ASR-9 serves the airports with high-activity levels and will not be replaced by the ASR-11. The Service Life Extension Program will determine those parts that are most prone to fail and replace them with more reliable components. This will improve reliability, preventing delays due to radar outages at the high-activity airports.

2A01: Terminal Business Unit: 2A01H; Terminal Applied Engineering

- **Terminal Applied Engineering**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Terminal Applied Engineering program contributes to the FAA’s system efficiency goal by providing an analysis of engineering issues involved in delivering and installing new equipment to ATCTs and TRACONs. Air traffic growth, changes in airspace structure, and equipment modernization require adjustments to air traffic facilities. The engineering analysis minimizes disruptions and delays, thereby decreasing the probability of delays at the affected airport.

2A01: Terminal Business Unit: 2A01I; Precision Runway Monitor

- **Precision Runway Monitor**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Precision Runway Monitor system project contributes to the FAA’s system efficiency goal by increasing the number of aircraft that can simultaneously approach an airport for landing. There are ATC restrictions on allowing aircraft to fly side by side as they approach parallel runways. These restrictions primarily affect aircraft during limited visibility conditions. The precision runway monitor system allows simultaneous independent approaches to runways closer than 4,300 feet by utilizing a radar that provides a 1-second update of aircraft position information (instead of 4.8 seconds for a conventional airport surveillance radar), which increases the number of aircraft that can be handled during adverse weather conditions, effectively increasing airport capacity.

2A01: Terminal Business Unit: 2A01J; Houston Area Air Traffic System

- **Houston Area Air Traffic System**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Houston Area Air Traffic System project contributes to the FAA's system efficiency goal by providing air traffic control improvements and additional navigation aids in the Houston metropolitan area so that the new runway under construction at Houston can be used efficiently. New runways add capacity and reduce air traffic delays.

2A01: Terminal Business Unit: 2A01L; New York Integrated Control Complex

- **New York Integrated Control Complex**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal

The New York Integrated Control Complex project contributes to the FAA's system efficiency goal by combining the New York en route air route traffic control center (ARTCC) with the New York TRACON. This facility could improve air traffic service efficiencies of en route and radar facilities in different locations.

This project will replace the existing consolidated TRACON and the en route center with a single facility that will address capacity constraints in the New York area. There are several inefficiencies in current airspace configuration that will be addressed by a consolidated facility, such as:

- The airspace is not proportionally balanced due to geographic proximity of the region's three major airports.
- The present airspace design creates narrow one-way corridors that cannot handle increased levels of air traffic.
- The current route structure for arriving aircraft cannot provide a uniform flow of traffic to airports, which causes less efficient use of runways.
- Airspace limitations decrease air traffic controllers' efforts to improve efficiency by using multiple departure and approach paths to handle surges in air traffic.

Consolidating the facilities and the airspace they control will allow more efficient use of the total airspace and reduce the artificial boundaries that inhibit efficient use of the airspace.

2A01: Terminal Business Unit: 2A01M; Aeronautical Data Link - Tower Data Link Services – Replacement

- **Aeronautical Data Link - Tower Data Link Services – Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The Tower Data Link Services project contributes to the FAA's system efficiency goal by replacing aging, obsolete ground data link systems and software that transmit ground clearances to pilots at multiple airports. Existing systems are old and require substantial maintenance.

2A01: Terminal Business Unit: 2A01X1; Flight Data Input/Output Phase II COTS Replacement

- **Flight Data Input/Output Phase II COTS Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The Flight Data Input/Output Replacement project contributes to the FAA's system efficiency goal by replacing existing systems that produce the flight data information for controllers on planned aircraft travel routes. The replacement system transfers and prints the flight data information to assist controllers in anticipating arrival of aircraft in the sector under their control.

2A01: Terminal Business Unit: 2A01X2; Mode Select – Provide

- **Secondary Surveillance – Mode Select**
- **Secondary Surveillance – Mode Select - Service Life Extension Program**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Mode Select (Mode S) project contributes to the FAA's system efficiency goal by upgrading 144 Mode S systems, which air traffic controllers use to separate and control traffic. Increasing Mode S reliability reduces outages and potential for air traffic delays. Modifications to the terminal Mode S interrogators have also made the traffic information system available to appropriately equipped aircraft (e.g., general aviation). The traffic information system transmits surveillance data to properly equipped aircraft allowing the pilot to visually track other aircraft in the vicinity by the use of a cockpit display.

2A02: Aeronautical Data Link Applications

- (A) **Aeronautical Data Link – Flight Information Service**
- (B) **Aeronautical Data Link – Controller Pilot Data Link Communications Build I/IA**

(A) Aeronautical Data Link – Flight Information Service

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Flight Information Service (FIS) project contributes to the FAA's air carrier and general aviation safety goals by providing new weather hazard graphics directly to pilots via data link for cockpit display. FIS implements the flight information services data link systems that provide timely data link broadcasts of graphic and text FIS/weather products to the cockpit. Weather is a major factor in many aviation accidents.

(B) Aeronautical Data Link – Controller Pilot Data Link Communications Build 1/IA

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Controller Pilot Data Link Communications (CPDLC) Build I/IA project contributes to the FAA's system efficiency goal by reducing voice communication frequency congestion. CPDLC Build 1 allows non-time critical predefined free-text messages to be sent to aircraft equipped with digital radios via a service provider's very high frequency data link mode 2 digital network. Using CPDLC, the controller and pilot can exchange messages rapidly during the aircraft's flight. Potential benefits include increases in the traffic handled in air traffic control sectors. (In an experimental sector, miles in trail restrictions were relaxed based on the reduction in voice communications.)

2A03: Free Flight Phase 2

- (A) Free Flight Phase 2 – Integration**
- (B) Free Flight Phase 2 – User Request Evaluation Tool**
- (C) Free Flight Phase 2 – Traffic Management Advisor - Single Center**
- (D) Free Flight Phase 2 – Collaborative-Decision Making**
- (E) Free Flight Phase 2 – Priority Research Support Efforts**

(A) Free Flight Phase 2 – Integration

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

This Free Flight Phase 2 (FFP2) Integration project contributes to the FAA's system efficiency goal by supporting field implementation teams for FFP2 and coordinating airspace redesign to implement FFP2 capabilities. FFP2 improves system efficiency through better use of existing system capacity, which enables more flights to reach destination airports without delays.

(B) Free Flight Phase 2 – User Request Evaluation Tool

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal

The User Request Evaluation Tool project contributes to the FAA's system efficiency goal by providing an automation tool that air traffic controllers in the ARTCC use to provide more direct routes for aircraft. The controllers use the tool to identify future flight path conflicts and to increase direct aircraft routing of by 15 percent. Direct routes save flight time and fuel.

(C) Free Flight Phase 2 – Traffic Management Advisor - Single Center

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Traffic Management Advisor - Single Center project contributes to the FAA's system efficiency goal by increasing capacity at selected airports by 3 percent. The program includes a tool that traffic management coordinators use to analyze traffic flow to major airports; it also allows aircraft spacing that optimizes use of runways at major airports.

(D) Free Flight Phase 2 – Collaborative Decision Making

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Collaborative Decision Making (CDM) project contributes to the FAA's system efficiency by coordinating air traffic information with airline operations centers to minimize the number and impact of delays. The FAA coordinates with air carriers to reroute traffic from busy sectors and areas with severe weather; both conditions can reduce delays in subsequent/connecting flights. CDM also provides current information and delay status to all interested parties.

(E) Free Flight Phase 2 – Priority Research Support Efforts

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Priority Research Support Efforts contribute to the FAA's system efficiency goal by developing new automation tools for Free Flight that RTCA recommends and that would benefit users in the 2003–2005 timeframe. These include direct-to; problem analysis, resolution, and ranking; traffic management advisor – multi center; and surface management systems. If implemented, these projects could produce benefits by providing automation tools to reduce air traffic delays. Additional products under development are the advance vortex spacing system; active final approach spacing tool; en route descent advisor; and expedite departure path.

2A04: Air Traffic Management:

- **Air Traffic Management – Traffic Flow Management – Current Enhanced Traffic Management System Operations**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Enhanced Traffic Flow Management System project contributes to the FAA's system efficiency goal by providing automation tools to 83 air traffic facilities (both centers and TRACONs). Traffic management coordinators or specialists at these facilities use the tools to handle air traffic disruptions and organize traffic flows to minimize delays. The Traffic Flow Management System is installed, but this project maintains and upgrades the existing system with commercial hardware and software.

2A05: Free Flight Phase 1

- **Free Flight Phase 1 – Sustain**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Free Flight Phase 1 (FFP1) Sustain program contributes to the FAA's systems efficiency goal by maintaining the automation tools developed in FFP1. Automation tools include the user request evaluation tool (URET), which allows more direct flights; CDM, which allows the FAA and aviation users to consult on air traffic congestion; and the surface movement advisor (SMA), which improves efficiency of aircraft movements on the airport surface. These tools allow more efficient use of runway capacity, which decreases delays, and allows aircraft to fly more efficient flight routes that save fuel.

2A06: Automated Surface Observing System

- **Automated Surface Observing System – Pre-Planned Product Improvements**
- **Automated Surface Observing System – Data Displays**
- **Automated Surface Observing System – Standalone Weather Systems**
- **Automated Surface Observing System Controller Equipment - Information Display System for Terminal Facilities**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Automated Surface Observing System (ASOS) program contributes to the FAA's system efficiency goal by providing ground systems that automatically report surface weather data that is distributed to ATC users. Pilots,

commercial and general aviation, and air traffic personnel use the weather data to plan flights more efficiently, and they are able to avoid diversions because they have better information on visibility conditions at the airport at which they intend to land. The aviation surface weather observation network includes the automated weather observing system (AWOS), ASOS, automated weather sensors systems, stand-alone weather sensors, and the ASOS controller equipment information display system (ACE-IDS or data displays).

The ASOS provides air traffic controllers with critical weather parameters that are vital for deciding whether or not to approve aircraft landings and takeoffs, which impact the number of delays at airports. The automated weather sensors system provides pilots and other users with minute-by-minute weather data updates, such as changes in winds, altimeter readings, and visibility. The stand-alone weather sensors provide wind, temperature, and dew point information as a backup for ASOS at service level C sites. ACE-IDS presents required weather and other operational information in the tower and TRACON via a local area network or a wide area network. The ACE-IDS project contributes to the FAA system efficiency goal by depicting information the controller needs on weather and NAS status on a single display. The IDS can display data from a wide variety of sources, including weather-sensing systems, status of runway lights, status of navigational aids, and status of landing aids. Having quick access to all this information, the controller can better inform pilots of airport conditions and spend less time searching for information.

2A07: Flight Service Station Information Display System

- **Automated Surface Observing System Controller Equipment - Information Display System for Automated Flight Service Station**

Primary Outcome Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The Flight Service Information Display System project contributes to the FAA's system efficiency goal by providing a standardized information system to assist flight service specialists in briefing pilots on weather conditions and NAS status. This system will make flight service specialists more productive and provide more timely information to pilots. Improving the availability and timeliness of pilot briefings will save time and result in better flight planning.

2A08: Information Display System – Terminal Facilities

- **Automated Surface Observing System Controller Equipment - Information Display System for terminal facilities**

Primary Outcome Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The ACE-IDS project contributes to the FAA's system efficiency goal by depicting information the controller needs on weather and NAS status on a single display. The IDS can display data from a wide variety of sources, including weather-sensing systems, status of runway lights, status of navigational aids, and status of landing aids. Having quick access to all this information, the controller can better inform pilots of airport conditions and spend less time searching for information. Next-generation nationwide data display project will add new information and weather display capabilities that will be deployed at facilities that currently lack data display capability.

2B01: Next Generation Very High Frequency Air-to-Ground Communications System

- Next Generation Air-to-Ground Communications System – Segment 1a
- Next Generation Air-to-Ground Communications System – Segment 1b
- Next Generation Air-to-Ground Communications System – Segments 2/3

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Next Generation Very High Frequency Air-to-Ground (A/G) Communication System program contributes to the FAA's system efficiency goal by expanding the number of communication channels within the spectrum assigned to the FAA. This provides for quicker and accurate radio communications between the controller and pilot, which enables controllers to respond more quickly to pilot requests. The FAA will be acquiring new digital A/G radios (to replace aging analog radios) and other necessary equipment to provide an end-to-end digital A/G communications capability. This capability increases the capacity to meet current and near-term air traffic control radio communication demands. The next generation A/G communications segments will provide a significant increase in channel availability for communications between air traffic controllers and pilots.

2B02: En Route Automation Program

- En Route Automation Modernization

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The En Route Automation Modernization (ERAM) program contributes to the FAA's system efficiency goal by modernizing the computer system that is the heart of air traffic control automation at the 20 ARTCCs in the continental United States. System efficiencies enabled by ERAM include availability of safety alerts during use of the backup mode; flexible routing around congestion, weather, and restrictions; increased number and type of surveillance information; and increased capabilities for incorporating future enhancements into the NAS. The ERAM solution will replace the current host computer system (HCS) software/hardware, the current direct access radar channel (DARC) (i.e., the backup system), and other associated peripherals. The solution will be standards-based, ICAO-compliant, secure, modular, and expandable.

2B03: Weather and Radar Processor

- Weather and Radar Processor – Stage 3 – Sustain Weather Operations
- Weather and Radar Processor – Tech Refresh/Product Upgrades

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Weather and Radar Processor (WARP) projects contribute to the FAA's system efficiency goal by providing timely weather data acquisition and dissemination capability to help en route air traffic control facilities minimize delays and disruptions to air travel. The WARP is an automated processing system that continuously acquires, stores, distributes, and displays weather information and radar products from external sources. The WARP processes weather information from the NEXRAD Doppler weather radar and provides timely and accurate forecast weather products to other NAS systems, which contributes to NAS efficiency. The WARP Stage 3 upgrades accommodate changes made to WARP input sources (data, models, and sensors), which allows for continuation of weather data and distribution operations.

2B04X: Automatic Dependent Surveillance National Implementation – Future Program

- **Automatic Dependent Surveillance National Implementation**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Automatic Dependent Surveillance (ADS) National Implementation program contributes to the FAA's system efficiency goal by providing improved surveillance of aircraft to pilots and ATC user tools that will enable more efficient traffic flows in the NAS. Implementation includes developing and deploying ADS ground stations in the en route, terminal, and surface domains, along with automation and communication system modifications necessary to support ADS capabilities.

Using ADS, aircraft can fly at optimum altitude, speed, and routing, which result in better schedule reliability while a high level of safety is maintained. This increased efficiency stems from implementing ADS-enabled capabilities throughout the NAS, including, but not limited to, the following:

- Provision of "radar-like" services in areas not currently covered by radar.
- Improved performance of ATC Decision Support Tools with availability of improved surveillance data.
- Improved pilot situational awareness through broadcasting of ground-based surveillance data to aircraft.
- Provision of common situational awareness between pilots and ATC, which is necessary to support Free Flight initiatives.

2C01: Air Traffic Operations Management System

- **Air Traffic Operations Management System/Local/Wide Area Network**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

At the heart of the Air Traffic Operations' Management System (ATOMS) is a multi-tiered enterprise architecture named CATMIS – the Corporate Air Traffic Management Information System. The CATMIS goal is to provide a series of integrated systems, infrastructure and procedures that will coordinate the collection, storage, correlation and delivery of enterprise and operational information to the Air Traffic organization. At the core of the infrastructure is common data architecture. This architecture, comprised of the operational data store collects information from legacy systems, interactive web products and emerging facility systems.

Custom designed facility level applications employing techniques gained through the reengineering of administrative processes are needed to collect data to support the agency's cost accounting system (CAS) while at the same time reducing the current level of administrative workload. Data collection systems and a methodology for moving the data upstream will complete the distribution system. Accuracy and standardization will occur by collecting data only once, at the source (field facilities), and then efficiently sharing that data through CATMIS tools. Once data systems are established and distributed, effective analytical tools will be provided to assist Air Traffic in making business-based decisions for tomorrow's outcomes.

2C02: National Airspace System Management Automation Program

- **National Airspace System Management Automation Program**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goals:

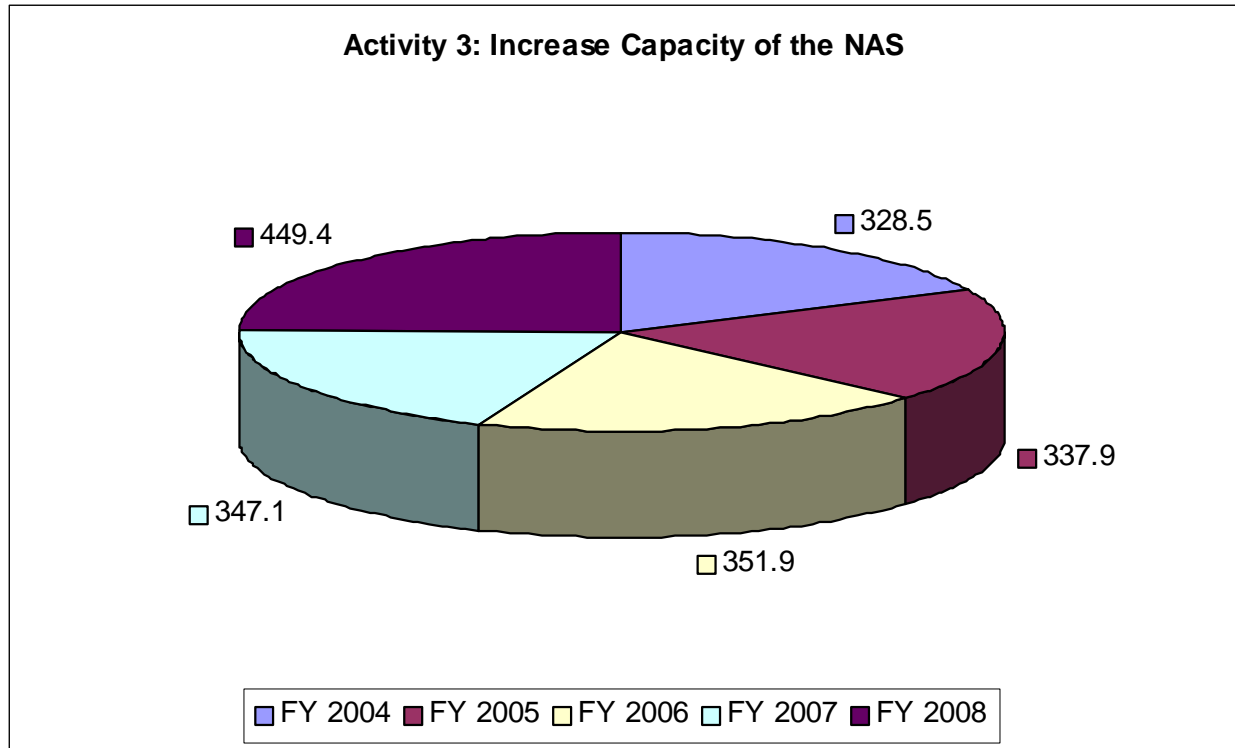
The National Airspace System Management Automation Program (NASMAP) has two main components: Air Traffic Services National Data Center (ATS NDC) and performance based Integrated Collaborative Environment (pb-ICE) tools.

The ATS NDC contributes to the FAA's system efficiency goal through the use of data sharing between NAS projects. The NASMAP establishes the central data repository of ATS corporate data for data sharing, develops interfaces between departmental and ATS NDC information systems, establishes the ATS data management program to achieve ATS standard data and data standardization, and develops the metadata repository to inventory ATS information systems. The final outcome of the NASMAP avoids redundant information system development efforts within ATS and increases the accuracy and integrity of ATS data.

The NASMAP pb-ICE tools contribute to the FAA system efficiency goal by providing a standard common collaborative toolset to use resources better. The pb-ICE toolset (e-Gov-compliant design) provides comprehensive coverage for performance-based organizations business operations, including a business portal to perform daily business activities, centralized information repository to retrieve related projects, workflow automation engine to automate repeatable business processes to improve efficiency and performance, and resource scheduling and tracking environment to plan and collaborate on activities and monitor the progress of NAS projects.

Activity 3: Increase Capacity of the National Airspace System

The following graph indicates the five-year distribution of funding for F&E programs that increase capacity of the NAS for FY 2004 to 2008. Funding is shown in millions of dollars.



3A01: Navigation and Landing Aids: 3A01A; Local Area Augmentation System for Global Positioning System

- **Local Area Augmentation System for Global Positioning System**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Local Area Augmentation System (LAAS) for the Global Positioning System (GPS) program contributes to the FAA's system efficiency goal by providing a satellite-based precision approach capability that meets the requirements for all weather approach and landing capability. Providing precision approach guidance at additional airports will allow landings in low visibility conditions, which increases schedule reliability for commercial carriers. The LAAS complements the wide area augmentation system by providing Category (CAT) I and CAT II/III precision approach capabilities. A single LAAS can provide approach guidance to multiple runways, which allows use of additional runways during adverse weather conditions.

3A01: Navigation and Landing Aids: 3A01B; Wide Area Augmentation System for Global Positioning System

- **Wide Area Augmentation System for Global Positioning System**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Wide Area Augmentation System (WAAS) for the GPS program contributes to the FAA's system efficiency goal by providing non-precision lateral navigation and vertical navigation (VNAV) capability to airports without such existing capabilities. Vertical guidance allows approaches to runways in low visibility conditions. After initial operational capability, expected in December 2003, pilots will be able to use lateral navigation with precision vertical guidance (LPV) approaches. LPV performance is within 50 feet of CAT I landing requirements, which supports close to CAT I minimums at many airports. WAAS also will reduce air traffic separation and provide more direct en route paths.

3A01: Navigation and Landing Aids: 3A01C; Very High Frequency Omni-Directional Radio Range with Distance Measuring Equipment

- **Very High Frequency Omni-Directional Range Collocated with Tactical Air Navigation**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

This Very High Frequency Omni-Directional Range Collocated with Tactical Air Navigation (VORTAC) program contributes to the FAA's system efficiency goal by replacing, relocating, or converting VORTAC facilities used for aerial navigation. VOR and Tactical Air Navigation systems increase NAS system efficiency by providing necessary enhancements, upgrades, and relocations to VOR and VORTAC facilities that are experiencing signal deterioration due to various environmental factors, which negatively impacts system efficiency. General aviation, commercial carriers, and other groups use this navigation capability for en route navigation and approach operations into airports.

3A01: Navigation and Landing Aids: 3A01D; Instrument Landing System – Establish/Upgrade

- **Instrument Landing Systems**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Establish/Upgrade Instrument Landing System (ILS) program contributes to the FAA's systems efficiency goal by providing the necessary equipment to establish, replace, and maintain the precision approach capability for new runways and existing runways that do not have precision approach guidance capability. These systems provide pilots precision guidance to a runway end in low visibility conditions; without the systems, takeoffs and landings would be restricted, and flight cancellations would occur in the NAS. ILS also helps meet increasing traffic demands by providing all-weather landing capability at additional runways.

3A01: Navigation and Landing Aids: 3A01E; Approach Lighting System Improvement Program

- **Visual Navigation Aids - Approach Lighting System Improvement Program Continuation**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Approach Lighting System Improvement Program (ALSIP) contributes to the FAA's air carrier and general aviation safety goal by replacing rigid, non-frangible lighting support structures with frangible approach lighting structures. These structures support the approach lights that help pilots see the runway during limited visibility conditions. If aircraft hit non-frangible lighting structures, they are seriously damaged. ALSIP provides high intensity approach lighting system with sequenced flashers (ALSF) model 2 and medium intensity approach lighting system with runway alignment indicator lights (MALSR).

3A01: Navigation and Landing Aids: 3A01F; Runway Visual Range

- **Runway Visual Range – Replacement/Establishment**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Runway Visual Range (RVR) Replacement project contributes to the FAA's air carrier and general aviation safety goals by replacing aging, maintenance-intensive and difficult-to-support RVR legacy systems. These systems provide pilots critical meteorological visibility data they need to decide whether or not it is safe to take off or land during limited visibility conditions.

The new-generation RVR equipment is mounted on frangible, low-impact-resistant structures that break away if hit by aircraft during takeoff or landing. Replacement equipment also reduces maintenance downtime and service time required for existing older navigation and landing aid equipment. This project also provides the equipment for new sites, including new runways and existing runways that have had an ILS installed.

3A01: Navigation and Landing Aids: 3A01G; Distance Measuring Equipment – Sustain

- **Distance Measuring Equipment – Sustain**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Distant Measuring Equipment (DME) Sustain project contributes to the FAA's system efficiency goal by replacing obsolete, tube-type DME with modern technology electronics that will improve operations and facilities performance. DME provides the distance component of navigation information that pilots use to determine aircraft position and that air traffic controllers use to route aircraft. In addition, replacement equipment reduces maintenance and repair downtime required for DME systems.

The DME Sustain project also provides for procurement and installation of approximately 177 DME systems to support the recommendations of the Commercial Aviation Safety Team. The 177 DME systems are used to reduce controlled flight into terrain accidents at the most vulnerable locations in the NAS.

3A01: Navigation and Landing Aids: 3A01H; Non-Directional Beacon Facilities – Sustain

- **Non-Directional Beacons – Sustain**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Non-Directional Beacons (NDB) Sustain program contributes to the FAA's system efficiency goal by replacing obsolete, tube-type NDB with current technology electronics that will upgrade equipment, which will improve operations and facilities performance. NDB systems help general aviation pilots and other users maintain correct position information and prevent controlled flights into terrain. Also, the replacement will reduce maintenance and repair downtime required for the antiquated DME systems.

3A01: Navigation and Landing Aids: 3A01I; Visual Navigation Aids – Establish/Expand

- **Visual Navigation Aids – Visual Navigation Aids for New Qualifiers**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Visual Navigation Aids project contributes to the FAA's system efficiency goal by providing a visual reference to the glide slope as a pilot approaches an airport. Precision approach path indicators (PAPI) and runway end identifier lights are used at various airports to help pilots quickly identify the runway threshold and make stabilized descents to clear obstructions at airports. The visual navigation aids provide lower landing minima, and pilots can land at airports that otherwise would be closed because of limited visibility.

This program also requires procurement and installation of about 170 PAPI systems to support the recommendations of the Commercial Aviation Safety Team. The systems provide vertical glide slope indicators at the highest-risk runways to reduce controlled flight into terrain accidents.

3A01: Navigation and Landing Aids: 3A01J; Visual Approach Slope Indicator Replacement – Replace with Precision Approach Path Indicator

- **Visual Navigation Aids – Replace Visual Approach Slope Indicator with Precision Approach Path Indicator**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Precision Approach Path Indicator (PAPI) program contributes to the FAA's system efficiency goal by replacing aging, obsolete visual approach slope indicators with the ICAO PAPI system. This system is an approach aid that gives pilots a visual reference to the runway, and it offers greater reliability and performance.

3A01: Navigation and Landing Aids: 3A01L; Navigation and Landing Aids – Service Life Extension Program

- **Visual Navigation Aids – Sustain, Replace, Relocate**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Navigation and Landing Aids Service Life Extension Program contributes to the FAA's system efficiency goal by replacing aging, obsolete ground-based navigation and landing aids that are necessary to maintain approach and landing capabilities at various airports throughout the United States. The upgraded equipment improves system efficiency by reducing the maintenance and repair downtime required for the older systems. Equipment outages reduce the approach capability at airports. Equipment upgraded under this program includes approach lighting system with sequenced flashers model-2; medium intensity approach lighting system with runway alignment indicator lights; PAPIs; runway end identifier lights; VORs; DME; and NDBs.

3A02: Oceanic Automation System

- **Advanced Technologies and Oceanic Procedures**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Advanced Technologies and Oceanic Procedures (ATOP) program contributes to the FAA's efficiency goal by modernizing FAA oceanic air traffic control systems and procedures. The new oceanic automation system sets the stage for reducing aircraft separation from 100 nautical miles to 30 nautical miles, which enables more planes to safely fly preferred routes. The ATOP program will provide a modernized oceanic air traffic control automation system. The ATOP system will collect, manage, and display oceanic air traffic data, including electronic flight-strip data on air traffic controllers displays and integrate such capabilities as flight data processing, radar data processing, automatic dependent surveillance, controller-pilot data link, and conflict probe.

The ATOP program will overcome capacity and efficiency limits due to lack of radar service over the oceans, limitations on surveillance of aircraft position, and delays in high-frequency voice communication relays. To do this, the program will marry more efficient data processing for faster, accurate, off-the-glass decision-making by controllers with procedures for safely handling more aircraft in the same airspace.

3A03: Voice Switching and Control System

- **Voice Switching and Control System – Voice Switching and Control System Control System Upgrade**
- **Voice Switching and Control System – Technology Refresh**
- **Voice Switching and Control System – Training and Backup Switch**
- **Voice Switching and Control System – Switch Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Voice Switching and Control System (VSCS) projects contribute to the FAA's system efficiency goal by upgrading VSCS equipment at all en route ARTCCs, the Mike Monroney Aeronautical Center (used for training air traffic controllers) and the William J. Hughes Technical Center (WJHTC) (used for test and evaluation of all ATC tools and systems). These upgrades ensure that A/G communications capabilities are reliable and available for separating aircraft, coordinating flight plans, and transferring information between ATC facilities.

3A04: Instrument Approach Procedures Automation

- **Instrument Approach Procedures Automation**
- **National Aeronautical Charting Office Hardware Replacement**

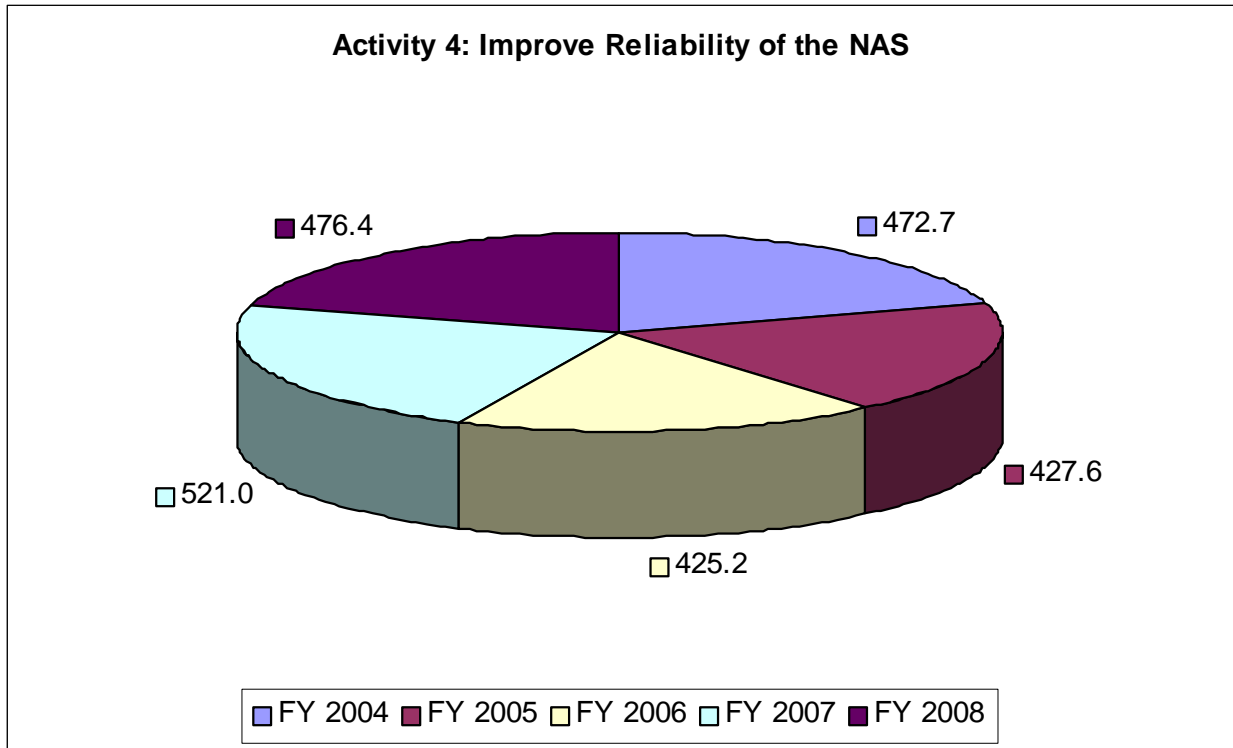
Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Instrument Approach Procedures Automation (IAPA) program contributes to the FAA's system efficiency goal by providing automated tools that enable FAA specialists to develop more timely and accurate instrument approach and departure procedures for pilots that ensure flight paths are clear of obstacles such as radio towers, buildings, and trees. Procedures developed by the IAPA program are provided to the National Aeronautical Charting Office and are used in the production of charts and maps for use by commercial and general aviation users. The automated tools reduce the time required to evaluate, revise, and update approach/departure procedures as requested by airports each year.

Activity 4: Improve Reliability of the National Airspace System

The following graph indicates the five-year distribution of funding for F&E programs that improve the reliability of the NAS for FY 2004 to 2008. Funding is shown in millions of dollars.



4A01: Guam Center Radar Approach Control - Relocate

- **Relocated Guam Center Radar Approach Control**

Primary Outcome Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal

The Guam Center Radar Approach (CERAP) relocation project supports the FAA's system efficiency goal by replacing the air traffic control facility for Agana International Airport, which was severely damaged by typhoon Paka. Replacement of the facility will allow updated equipment to be installed, which improves the efficiency of air traffic control for international service.

4A02: Terminal Voice Switch Replacement/Enhancement Terminal Voice Switch

- **Enhanced Terminal Voice Switch**
- **Command Center Voice Switch**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Terminal Voice Switch Replacement (TVSR)/Enhancement program contributes to the FAA's system efficiency goal by replacing the electromechanical and aging electronic switches in all ATCTs and TRACON facilities with modern reliable voice-switching systems. These switches provide the capability to communicate with other air traffic control facilities and aircraft.

The TVSR program consists of several multiyear equipment contracts, including small tower voice switch systems, operational support telephone systems, enhanced terminal voice switch systems, rapid deployment voice switch model IIA systems, and voice switch by-pass systems. Modern voice switches, like enhanced terminal voice switch and related rapid deployment voice switch IIA, meet air traffic controller needs and enable more effective air traffic operations.

4A03: Airport Cable Loop Systems – Sustained Support

- **Airport Cable Loop Systems Sustained Support**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Airport Cable Loop Sustained Support program contributes to the FAA's system efficiency goal by providing modern electrical distribution system infrastructure that enables continued operation of airport ATC facilities and approach and lighting systems. Airport cable loops both distribute electrical power and gather data on the operational status of such airport equipment as ILS and runway lights. The information is sent to air traffic control and maintenance facilities. Another purpose of the project is to standardize the design and installation procedures for fiber optic transmission systems, which will simplify configuration management, training, and depot and logistics support.

4B01: En Route Automation Program

- (A) En Route Automation Program – En Route Enhancements**
- (B) En Route Automation Program – Flight Data Input/Output Replacement**
- (C) En Route Automation Program – Direct Access Radar Channel**
- (D) En Route Automation Program – Host/Oceanic Computer System Replacement**
- (E) En Route Automation Program – En Route Communications Gateway**
 - **En Route Automation Program – En Route Communications Gateway – Tech Refresh**
- (F) En Route Automation Program – En Route System Modification**
- (G) En Route Automation Program – En Route Monitor and Control**
- (H) En Route Automation Program – Aeronautical Information and Flight Planning Enhancements**
- (I) En Route Automation Program – FAA Aeronautical Training Systems (Initial Academy Training)**

(A) En Route Automation Program – En Route Enhancements

Primary Outcome Goal: FAA Goal: Capacity and Efficiency: Provide an aerospace transportation system that continues to meet the capacity needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The En Route Enhancements project contributes to the FAA's system efficiency goal by providing new capabilities and enhancements to the ARTCC host computer system (HCS) and display systems (DSR) software. The HCS and DSR are the primary processor and display system used to control air traffic in 20 ARTCCs. En Route Enhancements maintain and upgrade HCS and DSR system software at the ARTCCs, which enables air traffic control to separate air traffic in the en route portion of flight.

(C) En Route Automation Program – Direct Access Radar Channel

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Direct Access Radar Channel project contributes to FAA's system efficiency goal by upgrading the existing independent backup radar automation and display capability. This gives the ARTCC controllers full redundancy in providing radar ATC services. Legacy hardware and interfaces will be eliminated, and current software architecture will be replaced starting in FY 2004 with one that provides hardware independence.

(D) En Route Automation Program – Host/Oceanic Computer System Replacement

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Host/Oceanic Computer System Replacement (HOCSR) program contributes to the FAA's system efficiency goal by enhancing the reliability and performance of the existing HSC. The program provides the central computer and peripheral equipment that processes and radar data and flight plans used by controllers to control and separate air traffic in the en route environment. The HOCSR program also provides upgrades to the critical peripheral equipment components that enable air traffic control.

(E) En Route Automation Program – En Route Communications Gateway

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The En Route Communications Gateway (ECG) project contributes to the FAA's efficiency goal by providing a replacement for the computer gateway that processes and sends external information to the host computer. ECG enables integration of new surveillance technology, introduction of new interface standards and formats, and connectivity to additional remote radars. ECG infrastructure will provide additional automation system capacity and expandability required to support anticipated increases in air traffic and changes to the operational environment.

(F) En Route Automation Program – En Route System Modification

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The En Route System Modification project contributes to the FAA's system efficiency goal by replacing aging or obsolete en route automation system components. The project will replace such obsolete components as system processors and upgrade and modernize the controller displays and the infrastructure that supports these displays. Replacing obsolete equipment helps to ensure reliability and maintainability of the en route automation system.

(G) En Route Automation Program – En Route Monitor and Control

Primary Outcome Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The En Route Monitor and Control (EMAC) project contributes to the FAA's system efficiency goal by supporting the separation of critical, essential, and routine functions of monitor and control throughout all en route facilities. This project will significantly reduce the number of ARTCC system operation center area monitor and control devices, which decreases software development and training costs, enables consolidated facility and legacy systems to interface with the NIMS provides space for implementation of new systems, and provides modern, open, and standardized monitor and control devices.

(H) En Route Automation Program – Aeronautical Information and Flight Planning Enhancements

Primary Outcome Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and as aerospace resources

Narrative for Primary Outcome Goal:

The Aeronautical Information and Flight Planning Enhancements project contributes to the FAA's system efficiency goal by transitioning en route automation systems from the current unique NAS flight data processing to ICAO compliant flight data processing. This will increase efficiency by taking advantage of the benefits of the ICAO standard and enabling cross-border data exchange to improve ATC efficiency.

(I) En Route Automation Program – FAA Aeronautical Training Systems (Initial Academy Training)

Primary Outcome Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and as aerospace resources

Narrative for Primary Outcome Goal:

The FAA Aeronautical Training Systems project contributes to the FAA's system efficiency goal by modernizing new training equipment to prepare and develop the required levels of knowledge and expertise within the ATC

workforce. This training and simulation system replicates the en route operational environment and provides a high fidelity, independent platform for the FAA Academy in Oklahoma City. The new Academy training system is necessary to meet the urgent requirement for new controller training.

4B02: Air Route Traffic Control Center Building Improvements/Plant Improvements

- **Air Route Traffic Control Center Modernization/Expansion – Air Route Traffic Control Center Modernization**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Air Route Traffic Control Center (ARTCC) Modernization/Expansion project contributes to the FAA's system efficiency goal by ensuring that buildings that house en route control equipment are modified, as necessary, to accept new equipment and maintained in good condition to avoid ATC outages because of failures in such infrastructure systems as electrical distribution systems. The project maintains the integrity of 21 ARTCCs, the Honolulu control facility (HCF) and two center radar approach control (CERAP) facilities, and upgrades these facilities for the integration and transition of new NAS systems. Modernizing ARTCC, HCF, and CERAP building infrastructure, such as electrical wiring, heating and ventilation systems, and structural components reduces the chances of outages, which cause air traffic delays.

4B03: Air Traffic Management

- (A) **Air Traffic Management Functionality Development/Deployment – Departure Spacing Program**
- (B) **Traffic Flow Management Infrastructure – Infrastructure Modernization**

(A) Air Traffic Management Functionality Development/Deployment – Departure Spacing Program

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The current Traffic Flow Management Infrastructure (TFM-I) project requires modernization to enable full traffic system integration. The Departure Spacing Program will be baselined as a formal NAS system and expanded into additional facilities in the Boston and Washington, DC, metropolitan areas. The program provides more efficient departure management tools to decrease the number of delays and lower associated costs of imposed delays, thus providing greater economic benefit to the user community.

(B) Traffic Flow Management Infrastructure – Infrastructure Modernization

Primary Outcome Goal: FAA Goal: System Efficiency: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Traffic Flow Management Infrastructure (TFM-I) is a NAS Architecture component connecting TFM decision support systems and tools that help balance growing flight demands with NAS capacity within a dynamic environment. The present TFM-I has evolved through several hardware and software generations. The software has become increasingly difficult to maintain and modify and will not support emerging system requirements. The architecture platform is overly complicated and congested with multiple communication and network threads, and existing hardware systems are approaching end of shelf life. Additional enhancements planned under the modernization program will increase integration and interoperability with the overall air traffic management structure. Modernization will establish a robust, commercially available and standards-compliant TFM-I and will support current and future TFM needs for availability, performance, security, expandability, and supportability, as well as human-computer interaction.

4C01: Critical Telecommunications Support

- **Critical Telecommunications Support**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Critical Telecommunications Support projects contribute to the FAA's system efficiency goal by providing modifications to existing telecommunications systems at more than 5,000 facilities within the NAS. The projects provide funds for air traffic communications diversity, telecommunications additions based on changes in air traffic patterns, facility relocations and modifications, and emergency requirements. Because of evolving changes in air traffic patterns, air traffic growth, and facilities destruction (caused by severe weather), there is a continuing need for this category of projects.

4C02: Federal Aviation Administration Telecommunications Infrastructure

- **Federal Aviation Administration Telecommunications Infrastructure**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The FAA Telecommunications Infrastructure (FTI) projects contribute to the FAA's system efficiency goal by replacing existing telecommunications networks with newer systems that provide more bandwidth and more efficient network management tools. The FTI will centralize management and security functions and provide telecommunications services with integrated network management and provisioning capabilities. Over the next decade, the FTI will incrementally replace existing NAS telecommunications systems, which, in using modern business practices, will reduce unit costs for telecommunications services and increase bandwidth utilization.

4C03: Air-to-Ground Communications Infrastructure

- **Communications Facilities Enhancement – Expansion**
- **Communications Facilities Enhancement – Air to Ground Communications Radio Frequency Interference Elimination**
- **Backup Emergency Communications - Replacement**
- **Ultra High Frequency Radio Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Air-to-Ground (A/G) Communications Infrastructure projects contribute to the FAA's system efficiency goal by replacing aging and increasingly unreliable equipment, in addition to improving/upgrading associated sites and facilities. New communications sites are established to conform to new air traffic patterns and FAA changes to existing air traffic control facilities. Air traffic controllers use these sites to communicate with aircraft that are outside the range of radios located at their facilities. The A/G Communications Infrastructure program is a combination of the following FAA projects:

- **Communications Facilities Enhancements:** Provides new radio control facilities and/or modifies existing facilities to enhance the A/G communications between air traffic control and aircraft;
- **Radio Frequency Interference Elimination:** Provides modern communication and ancillary equipment to improve operational performance at select remote communication facilities and eliminate interference from commercial or other radio frequency emissions; and
- **Backup Emergency Communications:** Provides a dedicated channel/sector in place of a priority-based, shared outlet system and replaces 1970s technology system that is logistically unsupportable.

The Ultra High Frequency (UHF) Radio Replacement project contributes to the FAA's system efficiency goal by replacing aging equipment used to communicate with Department of Defense (DoD) aircraft. The FAA maintains the UHF A/G communications service for air traffic control of military operations in the United States. In August 2001, the office of the Secretary of Defense reaffirmed the military's continuing need for UHF A/G communications services for the foreseeable future. Subsequent events have served to demonstrate the need for the UHF service, especially during national emergencies.

4C04: Voice Recorder Replacement Program

- **Voice Recorder Replacement Program**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Voice Recorder Replacement Program contributes to the FAA's system efficiency goal by replacing aging, analog voice recording systems with modern digital voice recording systems. These systems record all voice communications between controllers, pilots, and other ground-based air traffic control facilities, which support safety investigations when accidents occur.

4C05: National Airspace System Infrastructure Management System

- **National Airspace System Infrastructure Management System – Phase 2**
- **National Airspace System Infrastructure Management System – Phase 2 Tech Refresh**
- **National Airspace System Infrastructure Management System – Phase 3**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace System Infrastructure Management System (NIMS) Phase 2 contributes to the FAA's system efficiency goal by centralizing information and technical expertise and providing remote monitoring and control capabilities. NIMS phase 2 fields a COTS-based information system that consists of distributed computers and integrated software/database applications for a national operational control center and three strategically located operational control centers to support air traffic services in meeting demand for increasing services with diminished resources while maintaining safety. Centralizing information such as maintenance history promotes informed, effective maintenance actions. Remote monitoring and control capabilities reduce maintenance personnel travel time and equipment downtime, saving time and money, improving efficiency, and reducing delays. With over 20,000 NAS facilities, many located far from maintenance personnel; reducing travel time and increasing maintenance personnel historical knowledge combine to yield increased service value at a reduced cost.

4C06: Flight Service Station Modernization

- **Flight Service Facilities – Automated Flight Service Stations Facilities Sustainment/Space Requirements**
- **Flight Service Facilities – Power Conditioning Systems Upgrade**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Automated Flight Service Station (AFSS) Facilities Sustainment program contributes to the FAA's system efficiency goal by upgrading and repairing AFSS/flight service station infrastructure, which includes heating/ventilation and air-conditioning systems, roofs, and fire and life safety upgrades. These upgrades ensure existence of proper environmental control in operations, equipment, and administrative areas.

4C07: Flight Services Automation System Operational and Supportability Implementation System

- **Flight Services Automation System Operational and Supportability Implementation System**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Flight Services Automation System (FSAS) Operational and Sustainment Implementation System (OASIS) program contributes to the FAA system efficiency goal by offering significant improvement in the computer-human interface for systems used to provide weather briefings and accept flight plans from pilots. Existing FSAS displays are upgraded with a graphical user interface. Flight service stations accept flight plans from pilots and transmit instrument rules flight plans to the en route centers so that controllers can plan for aircraft entering their sector. Flight service stations also provide weather briefings to general aviation pilots to help them avoid severe weather conditions and to predict weather visibility at destination airports.

4C08: Weather Message Switching Center Replacement

- **Weather Message Switching Center Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The Weather Message Switching Center Replacement project contributes to the FAA's system efficiency goal by collecting and disseminating weather information to air traffic facilities more efficiently. The present system is obsolete and difficult to maintain. In addition, the weather information that is distributed from the switching center can be delayed during periods of high demand.

4C09: Flight Service Station Switch Modernization

- **Automated Flight Service Station Voice Switches**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Flight Service Stations (FSS) Switch Modernization program contributes to the FAA's safety goal by replacing aging, non-supportable FSS voice switches with modern digital voice switches to enhance preflight and in-flight services. The Automated Flight Service Station Voice Switch Replacement project provides pilots with significantly improved access to flight planning, weather, communications, and emergency services deemed essential to conducting safe and efficient flight. The program replaces the voice switches at 61 AFSSs throughout the NAS and at 14 non-automated FSSs located in Alaska.

4C10: Alaskan National Airspace System Interfacility Communications System

- **Alaskan National Airspace System Interfacility Communications System Satellite Network – Phase II**
- **Alaskan National Airspace System Interfacility Communications System Tech Refresh**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Alaskan National Airspace System Interfacility Communications System (ANICS) Satellite Network Phase II supports the FAA's system efficiency goal by installing FAA-owned satellite earth stations to provide essential telecommunications engineered for FAA-standard 99.9 percent availability at remote Alaskan air traffic control sites. ANICS Phase II will improve availability of essential communications compared to the existing commercial telecommunications service. The system will also reduce leased telecommunications costs. ANICS Phase I has been successfully implemented at 51 operational sites, decreasing remote air-ground telecommunications line

outages to less than 70 hours in FY 2002. ANICS sites have substantially improved communications service reliability, performance, maintainability, and capacity.

4C11: Electrical Power Systems – Sustain/Support

- **Power Systems Sustained Support**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Power Systems Sustain/Support project contributes to the FAA's systems efficiency goal by providing reliable and high-quality power sources for the facilities used in delivering air traffic control services. The FAA requires and must maintain independent power-generating systems to provide electrical power when there are commercial power outages. An extended electrical power outage would result in significant aviation delays.

4C12: National Airspace System Recovery Communications

- **National Airspace System Command and Control Communications Program**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace System Recovery Communications project contributes to the FAA's system efficiency goal by ensuring that during emergencies the FAA's command, control, and communication (C3) structure is able to provide time critical public and NAS information for the Administrator to be shared with the Administrator's staff, key regional managers, the Secretary of Transportation, and other national-level executive personnel. The attackers of September 11 uncovered shortfalls within the existing systems and facilities.

The NAS C3 program provides and enhances a variety of fixed position, portable, and transportable C3 systems for use in support of emergency operations. Such C3 systems include the automatic digital network/defense messaging system, secure telephone unit third generation/secure telephone equipment, secure facsimile, VHF/frequency modulated, high-frequency single side band, satellite telephone network, wireless notification system, secure conferencing system, and communications support teams. These systems can operate independent of commercial communications in emergency situations. C3 also provides modernization of several "continuity of operations" sites, which ensures Agency executives command and communication during times of crisis.

4C13: Aeronautical Center Infrastructure Modernization

- **Aeronautical Center Infrastructure Modernization**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Aeronautical Center Infrastructure Modernization project contributes to the FAA's system efficiency goal by providing up-to-date facilities and supporting infrastructure for organizations that support NAS operation. The project includes the following support: Training is provided each year in resident and distance learning formats for more than 30,000 FAA and international students, including air traffic controllers, Airway Facility technicians and certification/inspection personnel; logistics services and supply support are provided to all FAA locations and about 70 DoD and international organizations; cost accounting and payroll services are provided to the DOT organizations and the Transportation Security Administration; engineering services are provided for NAS system modifications and repair; flight check aircraft are deployed for calibration and certification of radar/navigation aids at all nationwide locations; Airmen and Aircraft Records and Registry are maintained; aviation medical research and human factors research are conducted; and other support is provided to critical air navigation systems throughout the NAS.

4C14: Frequency and Spectrum Engineering

- **National Airspace System Spectrum Engineering Management – National Airspace System Spectrum Engineering Sustained Support**
- **National Airspace System Spectrum Engineering Management – Frequency Interference Support/Resolution**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace System Spectrum Engineering project contributes to the FAA's system efficiency goal by providing careful and detailed frequency and spectrum planning necessary to ensure that current and future aeronautical safety systems are provided adequate radio spectrum. Spectrum management support must be provided to both government and non-government offices involved in the operation of current systems and to organizations planning new aeronautical systems. Spectrum support is also provided for all other FAA non-aeronautical systems.

4C15: NAS Interference, Detection, Location and Mitigation

- **NAS Interference Detection, Location, and Mitigation**

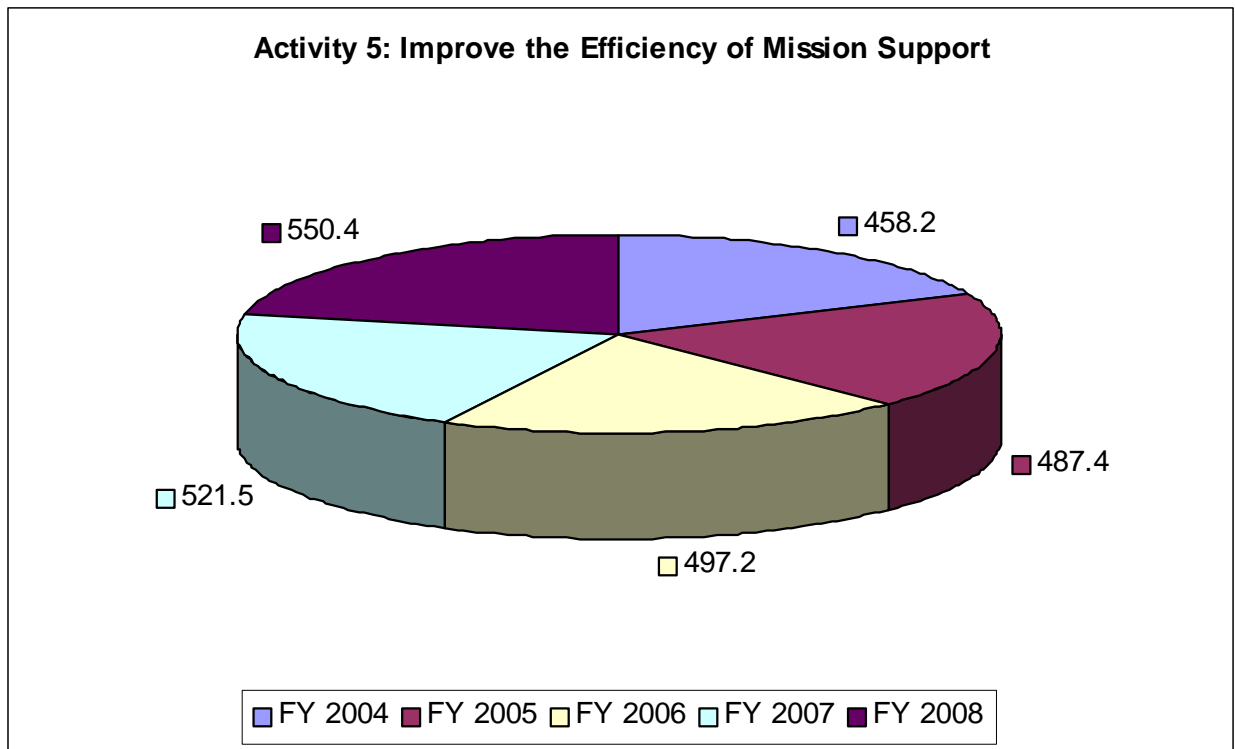
Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal

The NAS Interference Detection, Location, and Mitigation project contributes to the FAA's system efficiency goal by providing the equipment to quickly detect and locate radio frequency interference sources affecting FAA's equipment. Interference can disrupt air traffic control and cause delays. Rapid resolution leads to increased levels of aviation safety and more efficient use of airspace. In addition, this project includes upgrading existing radio frequency investigation capabilities to support interference detection to A/G communications and the global navigation satellite system.

Activity 5: Improve Efficiency of Mission Support

The following graph indicates the five-year distribution of funding for F&E programs that improve efficiency of mission support for FY 2004 to 2008. Funding is shown in millions of dollars.



5A01/5A02: National Airspace System Improvement of System Support Laboratory/ FAA William J. Hughes Technical Center Facilities

- **National Airspace System Improvement of System Support Laboratory**
- **Technical Center Facilities**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace System Improvement of the System Support Laboratory and Technical Center Facilities projects contribute to the FAA's system efficiency goal by upgrading and improving the agency's laboratory infrastructure at the William J. Hughes Technical Center. The facility tests new equipment, provides analysis of modernization proposals for existing systems, and provides the more sophisticated second-level field support for ATC programs. Each laboratory-supported capital development program contributes to one or more of the FAA and DOT goals.

5A03: William J. Hughes Technical Center Building and Plant Support

- **William J. Hughes Technical Center Infrastructure Sustainment**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The William J. Hughes Technical Center Infrastructure Sustainment project contributes to the FAA's system efficiency goal by refurbishing and replacing the center infrastructure. The existing infrastructure requires updating to ensure that the laboratories and other facilities operate properly and have the capacity to handle the electrical and heat loads generated by the equipment being tested.

5A04: En Route Communications and Control Facilities Improvements

- **En Route Communications and Control Facilities**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

En Route Communication and Control Facilities project contributes to the FAA's system efficiency goal by upgrading and improving various communication facilities and equipment throughout the NAS. These communication facilities and equipment provide a means for continuous and reliable A/G communications between the air traffic control personnel and the pilot.

5A05: Department of Defense/Federal Aviation Administration Facilities Transfer

- **Department of Defense/Federal Aviation Administration Air Traffic Control Facility Transfer/Modernization – Original Program**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that provides reliable and accurate information to air traffic controllers and pilots.

Narrative for Primary Outcome Goal:

The DoD/FAA Air Traffic Control Facility Transfer/Modernization program improves NAS reliability by replacing aged and unreliable facilities with modern reliable ones. Enhancements primarily include communications, weather, and surveillance systems. Consistent with the base closure process, DoD notifies DOT when military facilities are being closed. In some cases, the FAA must take over air traffic control responsibility. In other cases, air traffic or air navigation facilities are on DoD property and must be relocated or transferred to the FAA.

Modern communications, weather, and surveillance systems are essential to providing reliable and accurate information to air traffic controllers and pilots. The DoD Facility Transfer program implements multiyear projects. Past modernization projects have included fiber optic telecommunications, low-density microwave communications, electrical power supplies, short-term emergency power supplies, automated weather observation systems, digitized air traffic radar data, and facility security. These reliable, modern system enhancements meet air traffic control requirements and enable more effective air traffic operations.

5A06: Terminal Communications – Improve

- **Terminal Communications – Improve**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Terminal Communications Improve project supports the FAA's system efficiency goal by providing for local projects to improve communications at air traffic control facilities that control traffic into and out of airports. Growth in aviation, relocation of facilities, and interference problems can require relocation or enhancement of terminal communications facilities. Communications problems can slow air traffic controllers and create delays at airports.

5A07: Flight Service Facilities Improvements

- **Flight Service Facilities Improvements**

Primary outcome Goal; FAA Goal: Safety: Reduce fatal accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal

The Flight Services Facilities Improvements project contributes to the FAA's safety goal by maintaining flight service facilities to ensure that they can perform safety of flight functions reliably. The flight service stations prevent accidents by providing weather briefings to pilots and accepting instrument flight plans that ATC facilities use to track pilots.

5A08: Navigation and Landing Aids – Improve

- **Navigation and Landing Aids – Improve**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The Navigation and Landing Aids Improve project supports the FAA's system efficiency goal by continually upgrading and improving the existing services required by users for navigation and landing. Ensuring that damaged navigation and landing aids are repaired and that other aids are relocated to accommodate traffic demands prevents delays and maintains system efficiency.

5A09: Federal Aviation Administration Buildings and Equipment

- **Federal Aviation Administration and Equipment Sustain Support – Modernize /Improve**
- **Seismic Safety Risk Mitigation**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The FAA Buildings and Equipment project contributes to the FAA's system efficiency goal by refurbishing and upgrading existing FAA-owned facilities. The facilities house electronic equipment that must be protected from weather hazards, radio interference, and unauthorized entry. Thus, buildings require routine maintenance and upgrading to prevent equipment failures, which can create air traffic delays. Because some FAA facilities are

located in areas with high levels of seismic activity, they must be designed and rebuilt to protect personnel and equipment from future seismic events.

5A10: Air Navigational Aids and Air Traffic Control Facilities (Local Projects)

- **Continued General Support – Air Navigation Aids Facilities – Local Projects**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Air Navigation Aids and Air Traffic Control Facilities projects contribute to the FAA's system efficiency goal by ensuring that facilities and equipment failures do not jeopardize the safety and efficiency of the air traffic control environment. Communications, surveillance, weather information, and air traffic control facilities require alterations to support changes in local air traffic patterns, or replacement in case facilities are damaged by severe weather.

5A11: Computer-Aided Engineering Graphics Modernization

- **Computer-Aided Engineering Graphics Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Computer-Aided Engineering Graphics Modernization/Replacement program contributes to the FAA's system efficiency goal by using enhanced computer-aided design and drafting systems. This tool is coupled with a secure Web-based engineering system to facilitate drawing access, retrieval, and update, thus increasing the FAA's ability to implement capital improvements with correct and timely information. The system meets increasing user access needs by expanding and providing a flexible system interface to a suite of state-of-the-art graphical modeling and analysis tools. The computer-aided engineering graphics (CAEG) system provides transition planners and engineers with a set of software tools to support facilities and equipment modeling. The CAEG system also assists spectrum managers in protecting the radio frequency spectrum by providing them with effective tools to model radio coverage of existing and planned facilities. Using information collected from the enhanced traffic management system, terrain databases, existing facility data, and radio characteristics, the CAEG system aids in isolating radio frequency interference sources. The primary tool used by the FAA to perform this function is the radio coverage analysis system. In addition, airport engineers and consultants use CAEG to conduct obstruction evaluations to determine and isolate potential hazards to the navigable airspace. New construction in and around landing facilities is analyzed to determine violations to existing air safety constraints.

5A12: Information Technology Integration

- **Information Technology Integration**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Information Technology Integration project contributes to the FAA's system efficiency goal by decreasing the cost of delivering IT services without reducing service quality, and by optimizing IT decisions and resources across the agency. The e-Gov goal has specific targets for increasing business that the FAA conducts electronically. This will be accomplished through continued improvement of service delivery capabilities and development of project portfolios aimed at the key customer groups of citizens, businesses, other government agencies, and employees, as well as projects dedicated to improving internal efficiency and effectiveness. Expanding e-Gov is also one of the five main goals of the President's Management Agenda. As part of achieving this goal, the FAA will ensure that data and information that are used to conduct critical agency business, or disseminated outside the agency, are timely, accurate, accessible, understandable, and secure.

5A13: Operational Data Management System - NAS Aeronautical Information Management Enterprise System

- **National Airspace System Aeronautical System Resource**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Notice to Airmen (NOTAM) automated distribution system improves system efficiency by providing critical safety information to FAA ATC facilities in a timely and standardized format. In June 2001, an FAA memorandum identified two incidents, which highlighted some weakness in the current NOTAM system and emphasized the urgent need for a replacement system to help ensure critical safety information reaches the pilot and other users of the system. The NOTAM automated distribution solution includes towers/TRACONS, FSS, and ARTCCs of the NAS and also the air traffic control system command center in Herndon, VA. The automated distribution solution will provide standardization within the NAS, timeliness of delivery across the NAS, a centralized NOTAM source, and state-of-the-art entry and delivery of critical safety information using dedicated telecommunications network.

5A14: Logistics Support Systems and Facilities

- **Logistics Support Systems and Facilities – Asset and Supply Chain Management**

Primary Outcome Goal: FAA Goal: System Efficiency Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal

The Logistics Support System and Facilities projects contribute to the FAA's system efficiency goal by providing full lifecycle management of spare parts and other supplies to ensure cost efficiency and rapid delivery of products to multiple customers. The logistics system must be able to manage and ship repair parts and other supplies on a timely basis to avoid system outages and delays.

The Asset and Supply Chain Management program improves operational efficiency and effectiveness by providing a single integrated planning, inventory, and asset management system that is capable of producing performance, financial, and logistics information. The Logistics Support System and Facilities and Asset and Supply Chain Management program are both integrated sets of business solutions that, when working correctly through established interfaces, will allow the FAA to accurately account for all of its assets.

5A15: Test Equipment – Maintenance Support for Replacement

- **Test Equipment Modernization/Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Goal:

The Test Equipment Modernization/Replacement project contributes to the FAA's system efficiency goal by procuring the test equipment that ensures reliable NAS operation. As the FAA modernizes the NAS, it must purchase appropriate equipment to test installed systems. With this equipment, systems can be repaired efficiently, and outages can be shortened.

5A16: Facility Security Risk Management

- **Facility Security Risk Management**

Primary Outcome Goal: FAA Goal: Safety: Most of FAA's security functions have been transferred to the Transportation Security Administration and this strategic goal is under review.

Narrative for Primary Outcome Goal:

The Facilities Security Risk Management program contributes to the FAA's safety goal by ensuring that efforts are

in place to provide physical security at all FAA staffed facilities that conform to FAA Order 1600.69a. This order requires physical security protective measures and establishes standards, objectives, procedures, and techniques for protecting FAA employees, agency property, facilities, contractors, and the public. It implements mitigation measures and standards for facility security management, control, and safeguarding of assets and facilities.

5A17: Information Systems Security

- **Information Systems Security**

Primary Outcome Goal: FAA Goal: Safety: Most of FAA's security functions have been transferred to the Transportation Security Administration and this strategic goal is under review.

Narrative for Primary Outcome Goal:

The Information Systems Security (ISS) program contributes to the FAA's safety goal by safeguarding information through various means, such as information security access, Web-based protection, and activities to "firewall" electronic access. International terrorism has become a major threat to U.S. national security, and there are nation-states that have cyber capability and are unfriendly to the United States. The phenomenal growth of the Internet and the worldwide proliferation of sophisticated computer skills have created a potential threat to the nation's critical information infrastructure, including the air traffic control system. The FAA has three objectives in this area. The first objective is to ensure effective preparedness, detection, response, and recovery regarding cyber attacks. The second objective is to integrate information security efforts into all acquisition and operation phases to protect FAA people, buildings, and information. The third objective is to support the nation's efforts to safeguard homeland security, in particular the aviation infrastructure and industry.

5A18: Distance Learning

- **Distance Learning**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Distance Learning program contributes to the FAA's system efficiency goal by providing an alternative delivery mechanism for training the FAA workforce. Distance learning uses various technologies to make training infrastructure available at all significant FAA locations. Distance-learning products include advanced simulation and training course delivery capability at all field learning centers and the integration of NAS equipment subsystem mockups with computer-based instruction terminals.

5A19: National Airspace System Training Facilities

- **National Airspace System Training – Modernization**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace System Training Facilities Modernization program contributes to the FAA's system efficiency goal by improving air traffic control tower training through replacement of the FAA's outdated ATCT cab training simulator. In addition to the ATCT simulator, other improvements include:

- Upgrading classrooms to provide a more effective, efficient presentation and reduce course delivery costs;
- Replacing outdated laboratory equipment with more adequate numbers of actual current field test equipment, reducing class time and making the training more effective; and
- Improving communications between the FAA Academy, regional offices, Washington Headquarters, and field facilities. This results in significant cost savings achieved through increased accuracy and efficiency in the administration of training.

5A20: System Engineering and Development Support

- **System Engineering and Development Support**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Systems Engineering and Development Support project contributes to the FAA's system efficiency goal by providing support for designing and managing NAS modernization. With support contractor assistance, the FAA is able to increase the sophistication in planning and analyzing NAS system improvements.

5A21: Program Support Leases

- **Program Support Leases**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The FAA Program Support Leases project contributes to the FAA's system efficiency goal by providing funding for existing leases for land and space that directly support NAS operational facilities and such critical NAS components as radars and navigational aids. The leases are contractual commitments for facilities that are critical to ATC system operations.

5A22: Logistics Support Services

- **National Airspace System Regional/Center Logistics Support Services**

Primary Outcome Goal: FAA Goal: Mission Support: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace Regional/Center Logistics Support Services project contributes to the FAA's system efficiency goal by providing real estate, acquisition, and material management contractor support to regions and centers. The contractors maintain adequate documentation, suitable for independent audit, to provide a basis for the accounting system entries for capital cost of facilities throughout the FAA.

5A23: Mike Monroney Aeronautical Center – Leases

- **Aeronautical Center Lease**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Aeronautical Center Lease project contributes to the FAA's system efficiency goal by providing up-to-date facilities and supporting infrastructure that meet the needs of FAA mission support organizations located at the Aeronautical Center. The center's lease provides more than 1,090 acres of land and more than 90 buildings, towers, streets, and infrastructure. Center functions include training each year for more than 30,000 FAA and international students in resident and distance-learning formats (the FAA Academy, Transportation Safety Institute, and U.S. Coast Guard); logistics and supply support to all FAA locations and about 70 DoD and international organizations; cost accounting and payroll services for the FAA and other DOT organizations; engineering services for NAS modification and repair; flight check for calibration and certification of radar and navigation aids at all nationwide locations; airmen and aircraft records and registry; aviation medical research and human factors research; maintenance, administrative, and other support services for the FAA; and support to critical air navigation systems throughout the NAS.

5A24: In-Plant NAS Contract Support

- **In-Plant NAS Contract Support**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for the Primary Outcome Goal

The In-Plant NAS Contract Support project contributes to the FAA's system efficiency goal by augmenting the number of government contract personnel who manage NAS modernization contracts. These additional personnel help monitor contract progress, compliance, and problems. Without this assistance, the FAA would have to slow down the pace – and thus defer the benefits – of modernization.

5A25: Transition Engineering Support

- **National Airspace System Implementation Support Contract**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace System Implementation Support Contract (NISC) project contributes to the FAA's system efficiency support goal by providing highly technical engineering support services for the critical planning and transition of new equipment in FAA facilities for over 80 CIP projects within the NAS. The primary function of the NISC is to assist the FAA in ensuring that CIP projects are completed on schedule and within budget while meeting specifications and quality standards. This support helps integrate systems into the NAS and ensures that the equipment functions properly once delivered. NISC support ranges from establishing lightning protection standards that improve facility reliability and availability to providing planning support for installing ground transceivers in Alaska under the Capstone project. Support is also provided for planning new ATC systems, facility modernization, automation, information technology, and configuration management for FAA headquarters and field facilities.

5A26: Federal Aviation Administration Corporate System Architecture

- **Information Technology Infrastructure - Corporate Systems Architecture**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Information Technology Infrastructure project contributes to the FAA's system efficiency goal by developing an IT enterprise architecture that guides the designs for the FAA enterprise network, metropolitan area network, and Internet/Intranet Web pages. By developing a consistent architecture, the FAA information technology systems will be compatible and improve efficiency.

5A27: Technical Support Services Contract

- **Technical Support Services Contract**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Technical Support Services Contract contributes to the FAA's system efficiency by providing a vehicle that supplies a supplemental workforce to meet NAS modernization needs and schedules. The amount of skilled work needed to modernize the NAS far exceeds available in-house FAA resources. The FAA continues to deploy large quantities of new equipment in support of NAS modernization. Significant work is required for site surveys, and site preparation, and to install, modify, relocate, refurbish, or replace equipment by personnel with electronic, mechanical, and civil engineering skills. The Technical Support Services Contract also encompasses facility cleanup, and environmental and hazardous material remediation.

5A28: Resource Tracking Program

- **Resource Tracking Program**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of aerospace resources.

Narrative for Primary Outcome Goal:

The Resource Tracking Program (RTP) contributes to the FAA's system efficiency goal by providing a set of software tools that enhance F&E workforce productivity. These tools provide current schedules and cost information to engineers and managers regarding F&E projects, and support standardized project management processes across the ATS. They are also used to prepare the corporate work plan that the NAS implementation program uses to plan work and resources. NAS delivery schedules in the RTP are used to identify future budget requirements, prepare internal budgets, and plan for implementation. Additional functions of RTP include resource estimating, project tracking, performance measuring, and F&E project reporting from inception through capitalization.

5A29: Center for Advanced Aviation System Development

- **Center for Advanced Aviation System Development**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal

The Center for Advanced Aviation System Development project contributes to the FAA's system efficiency goal by assisting the agency in designing and developing new systems to increase the efficiency and effectiveness of NAS systems. The center performs analytical research, develops operational concepts, and tests new concepts. This support helps increase NAS efficiency by introducing new technology and procedures to handle growing air traffic demand.

5A30: Operational Evolution Plan

- **Operational Evolution Plan**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The Operational Evolution Plan (OEP) supports the FAA's system efficiency goal by analyzing the strategy to enhance NAS capacity and efficiency. This includes both terminal and en route assessments of procedures and capacity-related technologies to develop solutions for capacity bottlenecks. The OEP develops specific actions and strategies to improve air traffic flow and decrease delays.

5B01: National Airspace System Facilities Occupational Safety and Health Administration and Environmental Standards Compliance;

- **National Airspace System Facilities Occupational Safety and Health Administration**
 - (A) Occupational Safety and Health Administration Compliance**
 - (B) Fire Life Safety for Air Traffic Control Towers**
 - (C) Energy Conversation Implementation**
 - (D) Environmental Standards Compliance**
- **National Airspace System Facilities Occupational Safety and Health Administration - Environment Policy Development**

Primary Outcome Goal: FAA Goal: Human and Natural Environment: Protect and enhance communities and the natural environment affected by transportation.

Narrative for Primary Outcome Goal:

The NAS Facilities Occupational Safety and Health Administration and Environmental Standards Compliance program contributes to the FAA human and natural environment goal by providing funds that are used to implement programs to comply with occupational safety and health, environmental, fire life safety, and energy conservation requirements. The program implements new initiatives and modifies existing programs and facilities to meet that goal. In promoting a safe and environmentally sound workplace, agency liability costs associated with worker's compensation claims and environmental cleanup will be greatly reduced, as will adverse operational impacts to the NAS.

5B02: Fuel Storage Tank Replacement and Monitoring

- **Fuel Storage Tanks**

Primary Outcome Goal: FAA Goal: Human and Natural Environment: Protect and enhance communities and the natural environment affected by transportation.

Narrative for Primary Outcome Goal:

The Fuel Storage Tank Replacement and Monitoring program contributes to the FAA's goal of protecting and enhancing communities and the natural environment. The program ensures that FAA fuel storage tanks are properly designed, installed, monitored, and replaced to eliminate detrimental community and environmental damages resulting from leaking tanks. The program also ensures compliance with environmental and safety regulations of the U.S. Environmental Protection Agency in the Code of Federal Regulations, 40 Part 280; National Fire Protection Association standards; and pertinent state and local mandates.

5B03: Hazardous Materials Management

- **Environmental Cleanup/Hazardous Materials**

Primary Outcome Goal: FAA Goal: Human and Natural Environment: Protect and enhance communities and the natural environment affected by transportation.

Narrative for Primary Outcome Goal:

The Hazardous Materials Management program contributes to the FAA's goal of protecting and enhancing communities and the natural environment by ensuring proactive identification, assessment, remediation, and closure of contaminated FAA sites. The program also ensures compliance with environmental and safety regulations in U.S. Environmental Protection Agency Comprehensive Environmental Response Compensation and Liability Act; Occupational Safety and Health Administration requirements in the Code of Federal Regulations, 29; and pertinent state and local mandates.